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PRELIMINARY RESULTS OF MEASUREMENTS OF THE RIGIDITY OF THE EARTH

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Measurements of the temperature of the crust of the earth as found in the deepest mines show that it rises on the average about 0.02° C. for every meter below the surface; and as the rate of increase is even greater at greater depths it follows, as Lord Kelvin pointed out,[1] that the temperature in the interior must be high enough to melt the substances composing it, and for a long time it was considered that the vast bulk of the earth must be in a fluid, or at least semi-fluid, condition, a conclusion which was strongly supported by the fact of the ejection of molten lava from volcanoes.

The theoretical investigations of Lord Kelvin in 1863[2] indicated, however, that the earth must be considered a very rigid body, opposing an enormous resistance to changes of form such as tend to occur in consequence of the attractions of the sun and moon. It is evident from these investigations that the old idea (which is not entirely extinct) that we are living on a thin rock crust over an immense mass of molten lava must be abandoned.

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[1] *Philosophical Transactions*, 1863.

[2] *Ibid.*

The first attempt to measure the rigidity of the earth, that is, the resistance which it offers to change of shape, was made by G. H. and Horace Darwin in 1880.[1] They employed a horizontal pendulum by the use of which they hoped to measure the change in the direction of the gravitational vertical due to the attractions of the sun and moon; from which, by comparison with the values calculated on the basis of absolute rigidity, the effective rigidity could be determined. The results were so irregular and contradictory that no conclusion could be formed, and the Darwins express the belief that such experiments are not likely ever to furnish the desired results.

In the hands of Rebeur-Paschwitz this method did, however, give positive results confirming the deductions of Kelvin. Since then the method of the horizontal pendulum has been successfully employed by Ehlert, Kortazzi, Schweydar, Hecker, and Orloff, with essentially the same result, namely, that the coefficient of rigidity is found to be of the order 6×10^{11} c.g.s. (about the same as that of steel). The results deduced from Chandler's observations of the variation of the latitude give a value nearly twice as great.

But, in addition to the elastic yielding of any body ordinarily looked upon as solid there is a plastic yielding, characterized by a constant termed by Maxwell the "modulus of relaxation," and evidenced by a lag of the distortion of the earth relative to the forces producing it. Such experiments as these should be capable of determining the plasticity as well as the rigidity of the earth. To show what measure of reliability may be accorded to the observations mentioned, the following extract, Table I, is made of a discussion of these by Schweydar.[2]

Here $1-K$ represents the ratio of the observed amplitude of oscillation to that calculated on the assumption of absolute rigidity. κ represents the retardation (which should always be negative) of the phase of the observed motion relative to the phase of the disturbing forces.

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[1] *B.A.A.S. Reports*, York meeting, 1880.

[2] Dr. Wilhelm Schweydar, *Untersuchungen über die Gezeiten der Festen Erde*. Potsdam, 1912; Leipzig: B. G. Teubner.

The observations are divided into two classes, the latter being considerably more reliable than the former.

TABLE I

	Experimenter	K	κ
	v. Rebeur	0.362	+ 7°30′
	Kortazzi	.608	0
	“	.414	− 2°54′
	Ehlert	.448	+12° 1′
	Schweydar	.338	− 8°31′
	“	.158	+ 8°29′
N.-S.	Hecker	.643	−11°.9
	“	.565	− 0°.7
	“	.544	+13°.4
	Orloff	.412	+ 0°.8
E.-W.	Hecker	.259	− 7°.0
	“	.382	+ 5°.2
	“	.468	+20°.1
	Orloff	0.326	+ 3°.2

While the numbers in the second column agree in showing that the earth's rigidity is of the order of that of steel, the differences are so considerable that it is hardly likely that they can be relied upon to within 20 per cent.

If accurate, the third column would give a measure of the plastic yielding of the body of the earth to the action of the distorting forces of the sun and moon. As mentioned before, these should all be negative, whereas the great preponderance is in the direction of positive lag, which is meaningless; so that further than showing that the lag is small (and therefore the viscosity high) these results are practically valueless.

It will be conceded that there is great need for more accurate determinations, if our knowledge of the properties of the matter constituting the earth's interior is to be increased; and it was in the hope of obtaining results of a higher order of accuracy, as well as such directness and simplicity of apparatus as practically to eliminate all the difficulties and uncertainties which seem to be unavoidable in the use of the horizontal pendulum, that the experiments recorded here were undertaken.

The prime object of the investigation is the determination of the direction of the gravitational vertical, or rather of the changes to which it is subject in consequence of the attraction of the sun and moon and as modified by the resulting distortion of the body of the earth. But this may be furnished with any desired degree of accuracy by the changes in the position of the level of a liquid surface which is necessarily normal to the resultant of all the forces acting. If from these we can eliminate all but the gravitational forces the problem is solved.

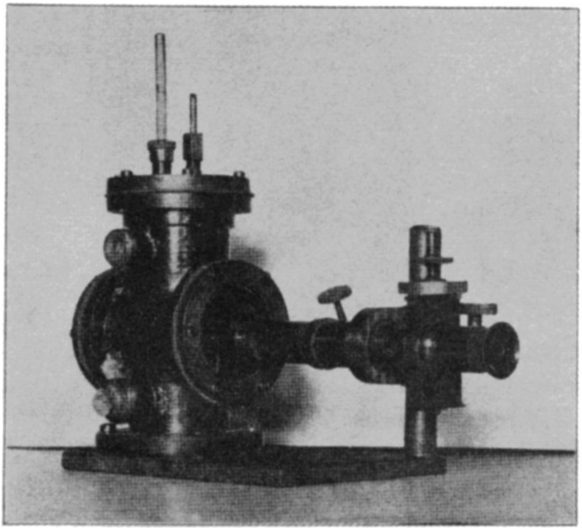

FIG. 1.—Microscope and gauge

A very sensitive method of measuring the changes in level is furnished by the interferometer; and a method of carrying this into practice was devised and the apparatus constructed[1] in 1910.

But before attempting to utilize so delicate an appliance it was deemed advisable to make these preliminary experiments with the microscope. Accordingly a 6-inch pipe, 500 feet long, was half filled with water,[2] the level of which could be read off through the glass sides of the end vessels, as shown in Fig. 1.

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[1] An interference apparatus for this purpose was independently devised by Professor A. G. Webster.

[2] The vessels at the ends were at first connected by a pipe filled with water, but with this arrangement temperature changes produced enormous disturbances in the level.

This pipe was laid in a trench six feet deep, terminating in two pits, eight feet square and ten feet deep, walled with concrete, in a soil of sandy clay on the grounds of the Yerkes Observatory at Williams Bay, Wisconsin. The direction (E.-W.) of the pipe was laid out by measuring from the meridian line and is probably correct to within one foot in five hundred. The pipe was then carefully leveled, and after verifying the continuity of the water and of the air space above it, the pipe was closed so that it was effectively air-tight, and the trench was filled with clay.

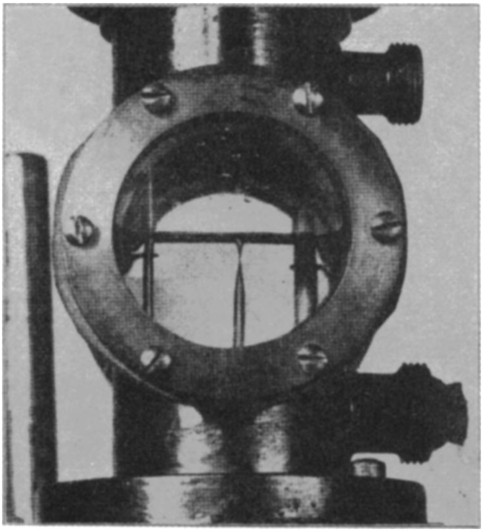

FIG. 2.—Point and totally reflected image

The distance between the total reflection image of a pointer, Fig. 2, and the direct image was read by micrometer microscopes of about 2-inch focus. These were calibrated at first rather roughly by measuring the diameter of a wire immersed in the water at the focus; and subsequently with much greater accuracy by measuring the known distance between two lines ruled on glass and placed in the focus, under water.

A preliminary series of observations was begun August 5 and continued until September 2 with such encouraging results that it was decided to supplement the work by observing on a N.–S. line which was accordingly laid out in the same manner as the E.–W. line.

The final calibration of the microscopes gave the following results:

West 17.52 turns = 1 mm
East 17.60 " = 1 mm
North 17.00 " = 1 mm
South 17.60 " = 1 mm

The mean for the E.–W. line is 17.56, and for the N.–S. line, 17.30. Accordingly the factor by which the calculated difference in level in mm should be multiplied to reduce to micrometer divisions is

For the E.–W. line, 285
For the N.–S. line, 289

The factor actually used in the computation was 293, and accordingly these should be diminished by 2.8 per cent for the E.–W. line, and by 1.4 per cent for the N.–S. line.

A continuous series of observations was conducted on both lines, beginning September 27 and ending November 29. The observations were made by setting the cross-hair of the micrometer on the pointer and taking a number of readings, the mean of which gave the fiducial reading to be subtracted from the readings of the reflected image. This difference was subtracted from a similar difference taken at the other end of the pipe, and the final differences from hour to hour (plus a constant) gave the observed curves. These readings were taken every hour from 6 A.M. until midnight, and every two hours from midnight until 6 A.M. The order of the observations was usually south end, north end, east end, west end. The time between readings at south end and north end, or between east end and west end, was about four minutes, and the mean between the two was taken to represent the time of observation. The mean time of the two observations gives the same result as though the observations had been simultaneous.

Occasionally the reflected image would be obscured by floating particles, and in clearing these away the value of the constant would be altered. The new constant was accordingly chosen so that the succeeding observations continued with the smallest discontinuity in the curve.

It was found that there was a gradual downward trend in the E.–W. curve during August, but little or none in the October-November series. The N.–S. line, however, on which readings were started the day after the pipe was covered, shows a considerable gradual drop. This was undoubtedly caused by uneven settling at the ends of the pipes. This was too slow to affect the result for the semi-diurnal period, but made doubtful the results for the fortnightly period.

The observations and their graphs are given in Tables III and IV and in Figs. 3 and 4.

In Figs. 5 to 12 these graphs are reproduced on a larger scale, together with those of the calculated values of the readings, multiplied by the factor 0.7 for the E.–W. line and 0.5 for the N.–S. line. The zero line of the observed readings is corrected to coincide with the calculated curve.

These curves were divided into periods corresponding to the semi-diurnal lunar tide, 12.42 hours, and the values at corresponding intervals of two hours tabulated and divided into groups of ten periods each.

The results of the comparison of the observed and calculated curves is given in Table II, in which the first column gives the ratio of the observed amplitudes to the calculated, on the assumption of an absolutely rigid earth, and the second the retardation of phase in hours.

TABLE II

RATIO OF AMPLITUDES		RETARDATION IN PHASE	
E.-W.	N.-S.	E.-W.	N.-S.
0.69	0.50	$-0^{h}.05$	$-0^{h}.06$
.79	.54	+ .30	+ .30
.65	.53	− .14	− .08
.71	.50	− .01	− .03
.82	.53	− .08	+ .12
.64	.52	− .14	− .20
.66	.50	− .08	.00
.70	.50	− .03	.00
.70	.50	− .12	− .06
.74	.50	− .16	− .02
.70	.48	− .12	+ .08
0.71	0.52	−0.08	+0.04
Mean=0.709×1.028	0.510×1.014	−0.059	+0.0075

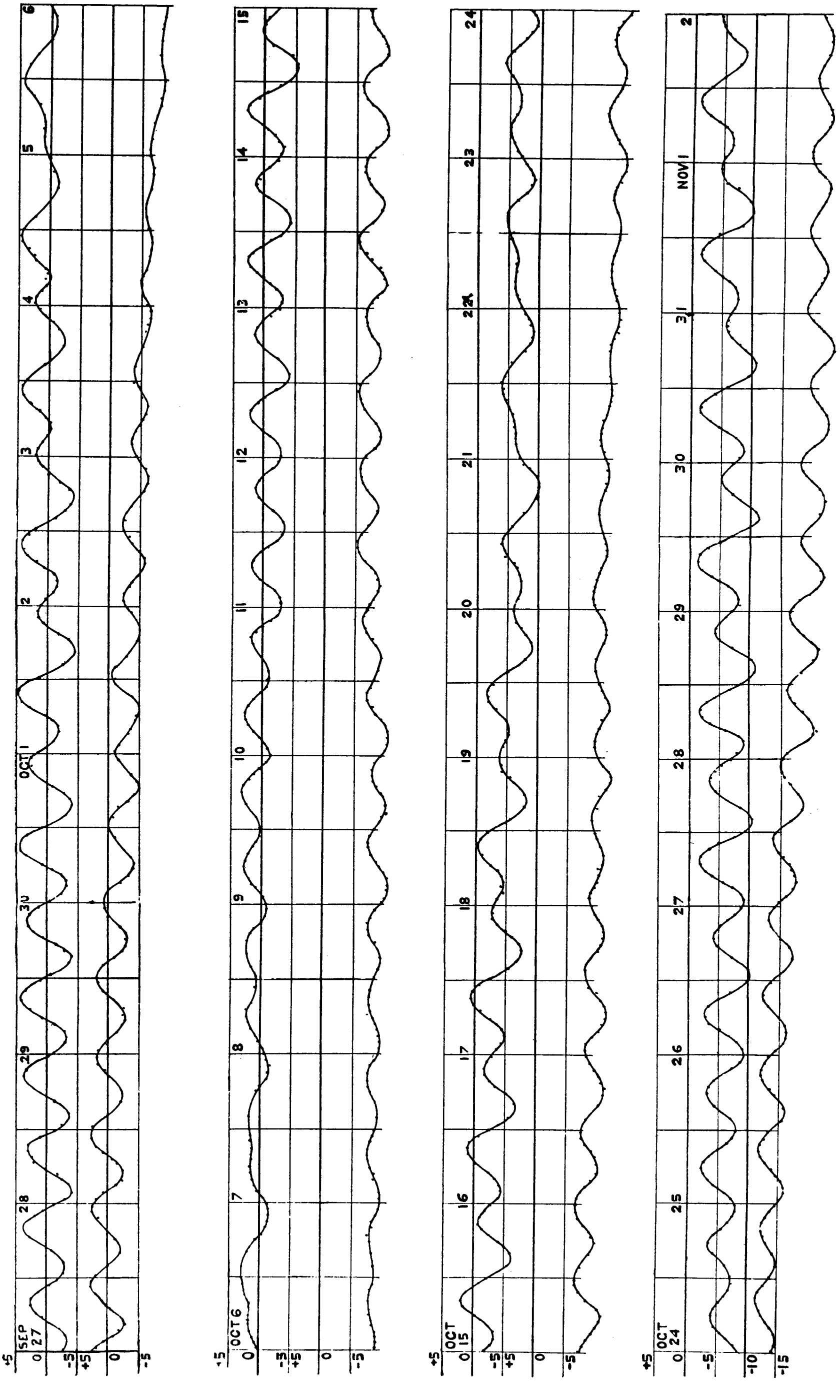

FIG. 3.—Upper curves, 10(E.—W.+C); lower curves, 10(S.—N.+C)

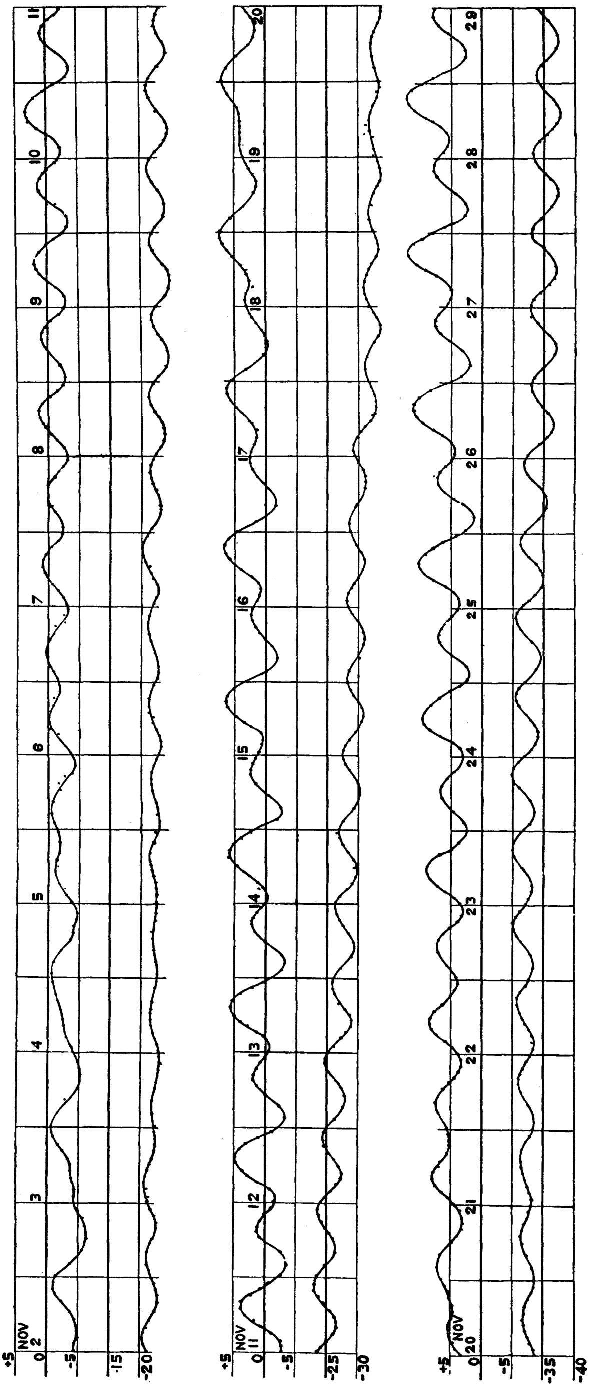

FIG. 4.—Upper curves, 10(E.—W.+C); lower curves, 10(S.—N.+C)

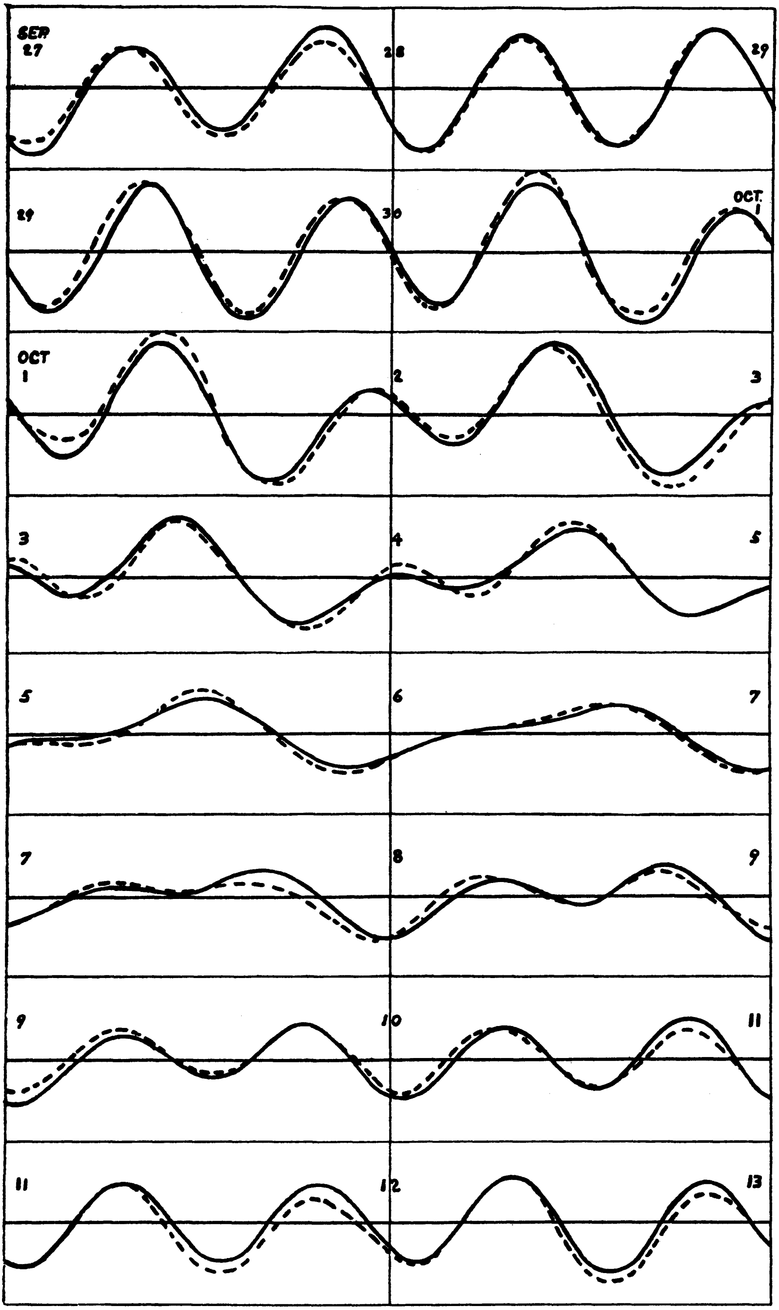

FIG. 5.—E.-W. Dotted curve, observed values; full curve, 0.7 of calculated

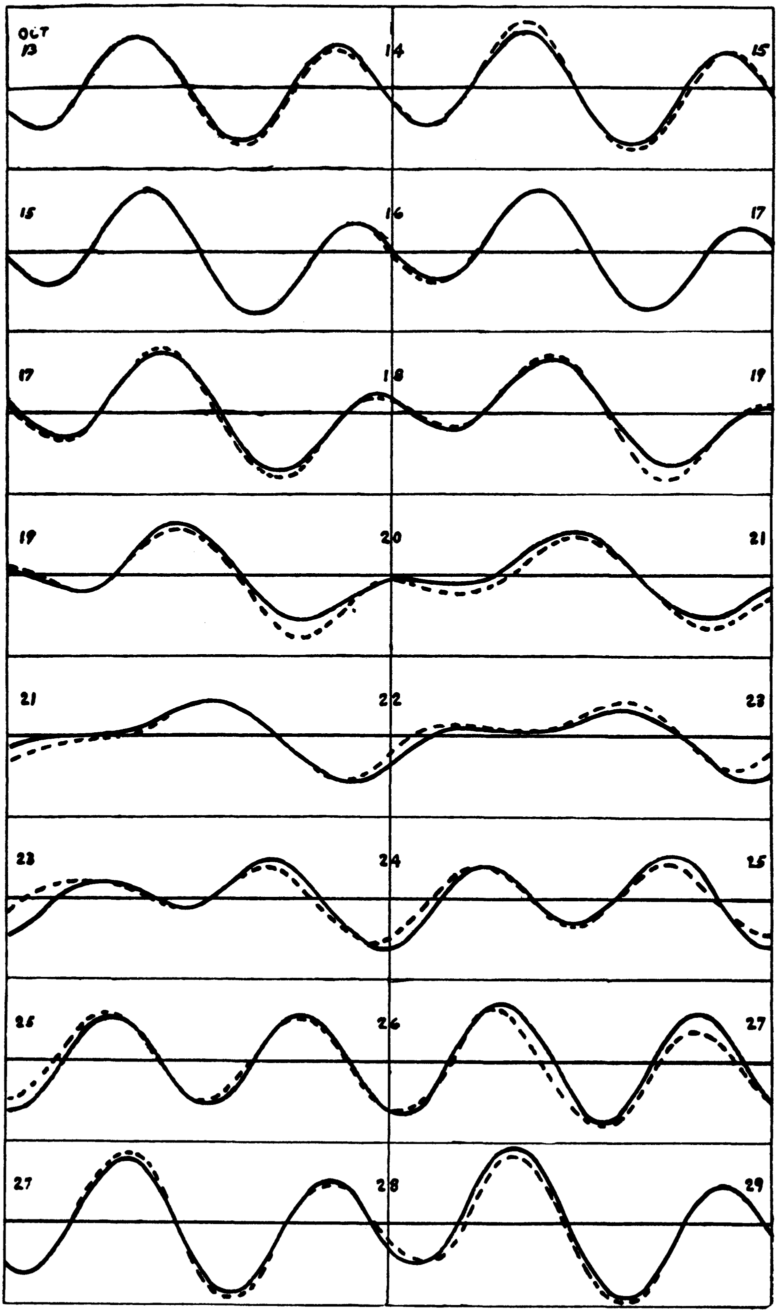

FIG. 6.—E.-W. Dotted curve, observed values; full curve, 0.7 of calculated

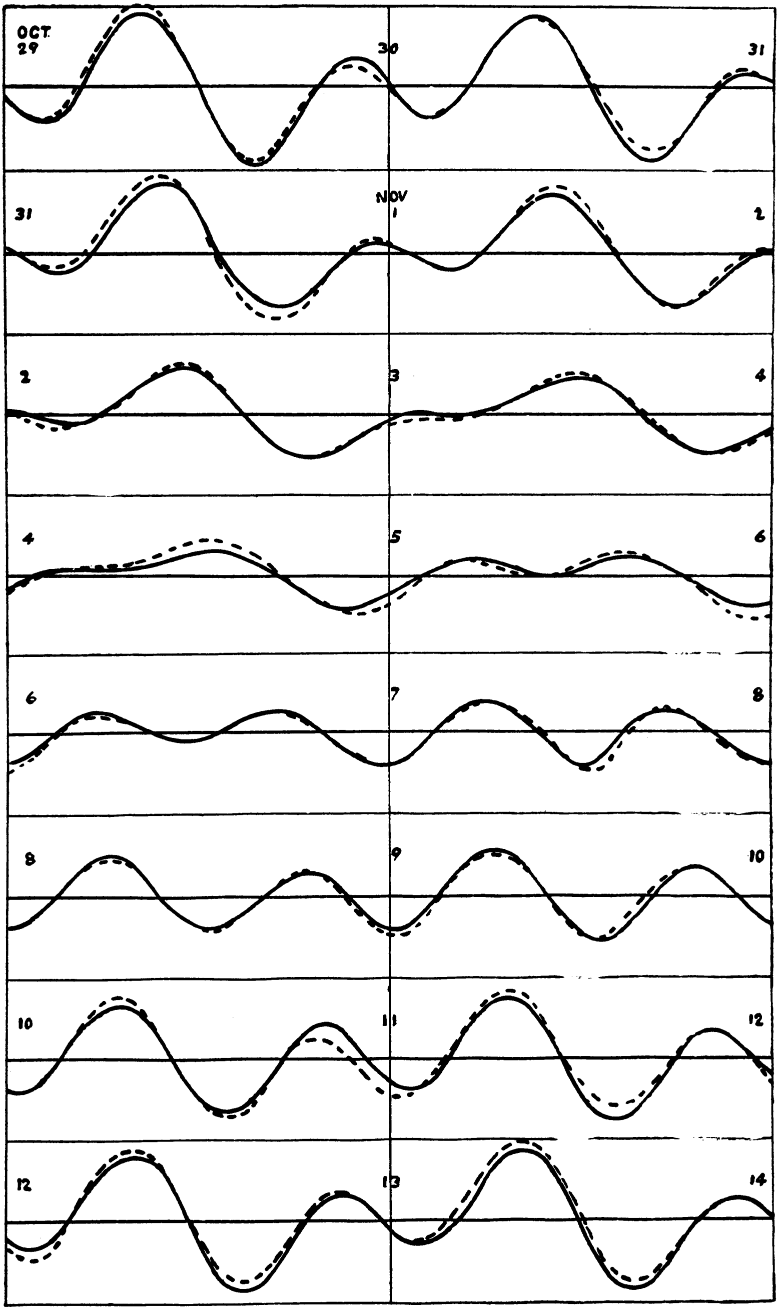

FIG. 7.—E.-W. Dotted curve, observed values; full curve, 0.7 of calculated

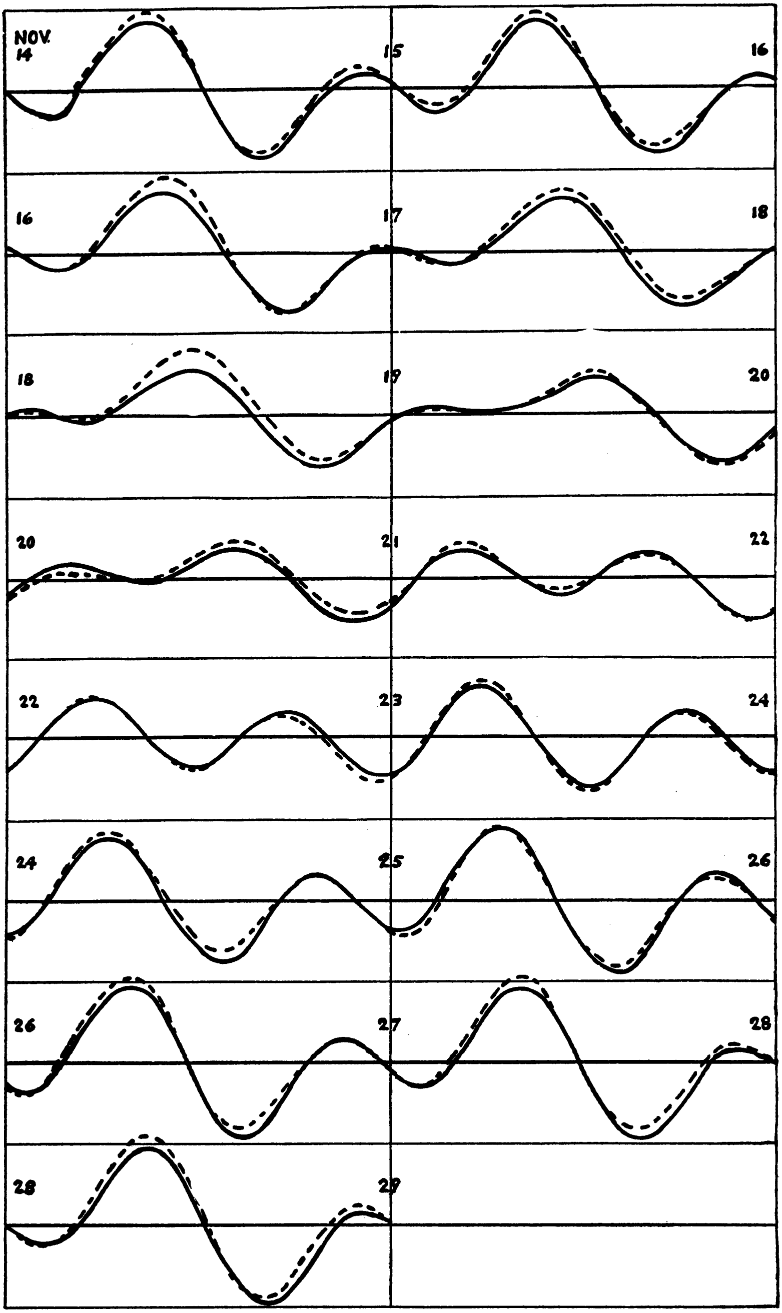

FIG. 8.—E.-W. Dotted curve, observed values; full curve, 0.7 of calculated

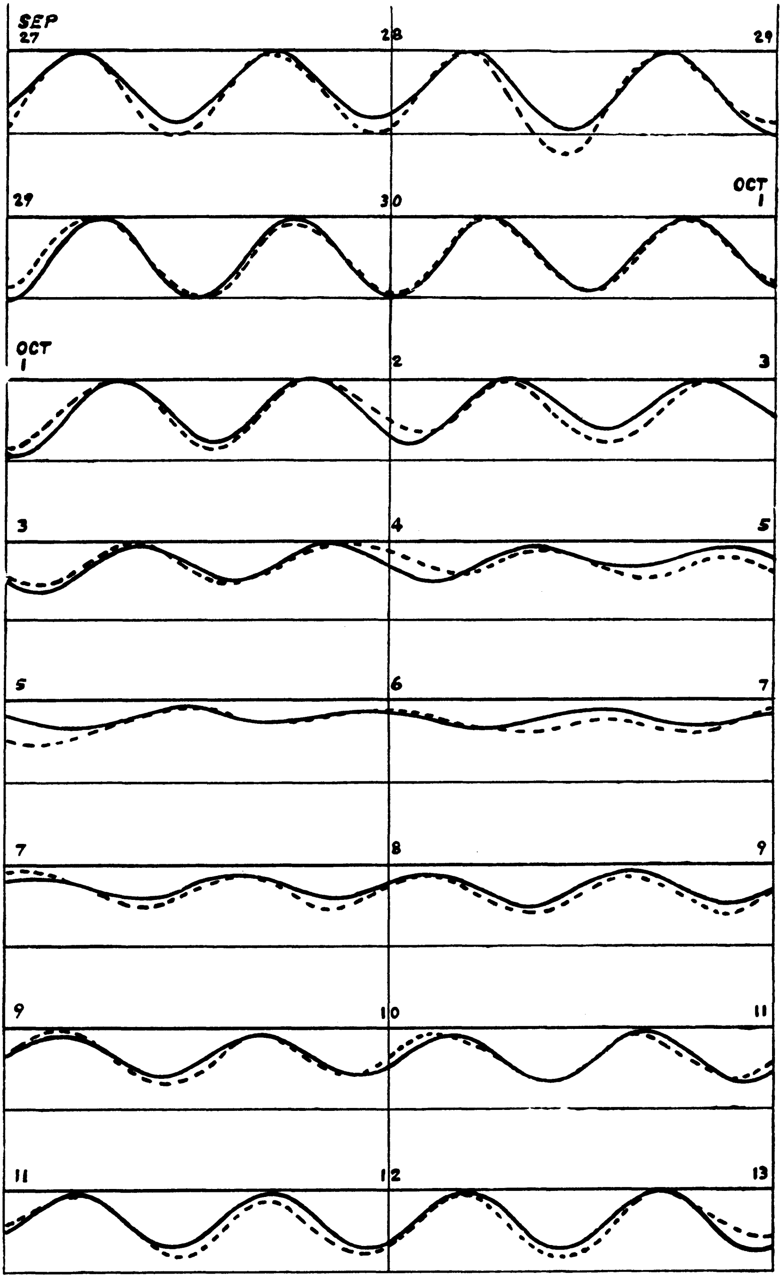

FIG. 9.—N.-S. Dotted curve, observed values; full curve, 0.5 of calculated

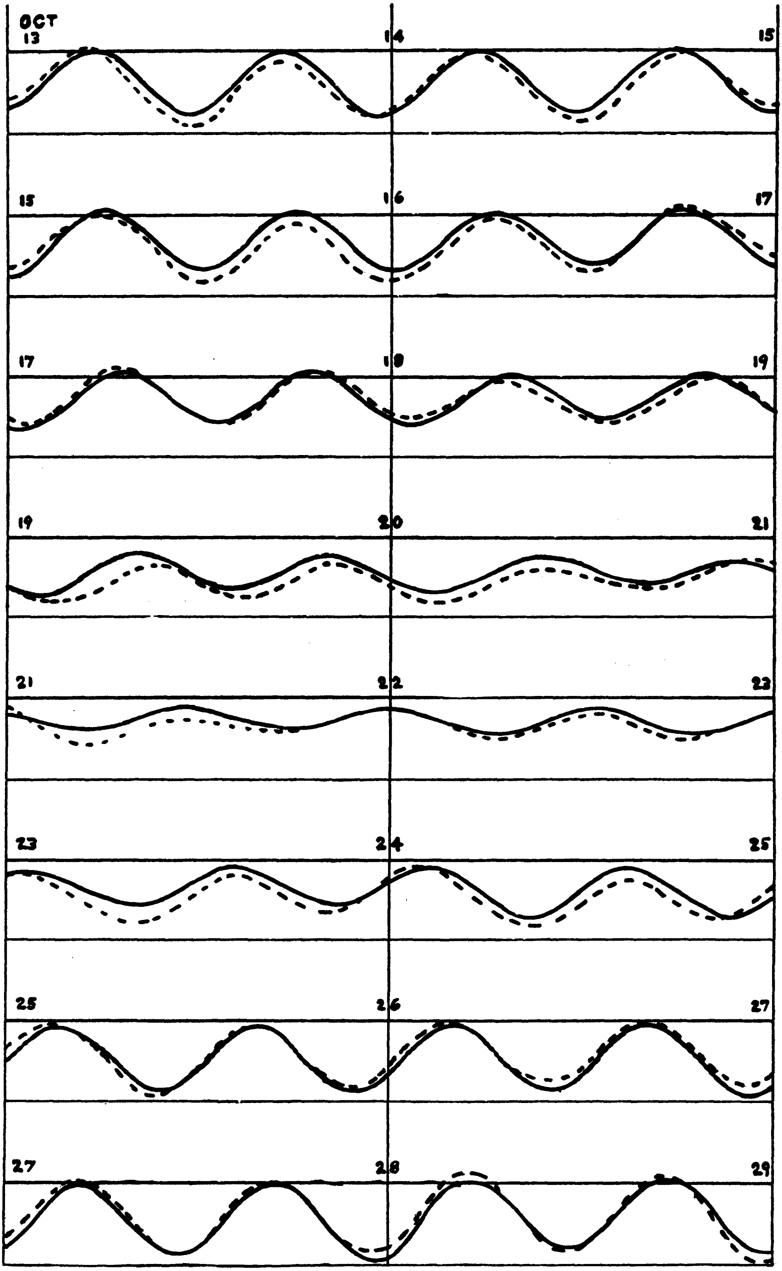

FIG. 10.—N.-S. Dotted curve, observed values; full curve, 0.5 of calculated

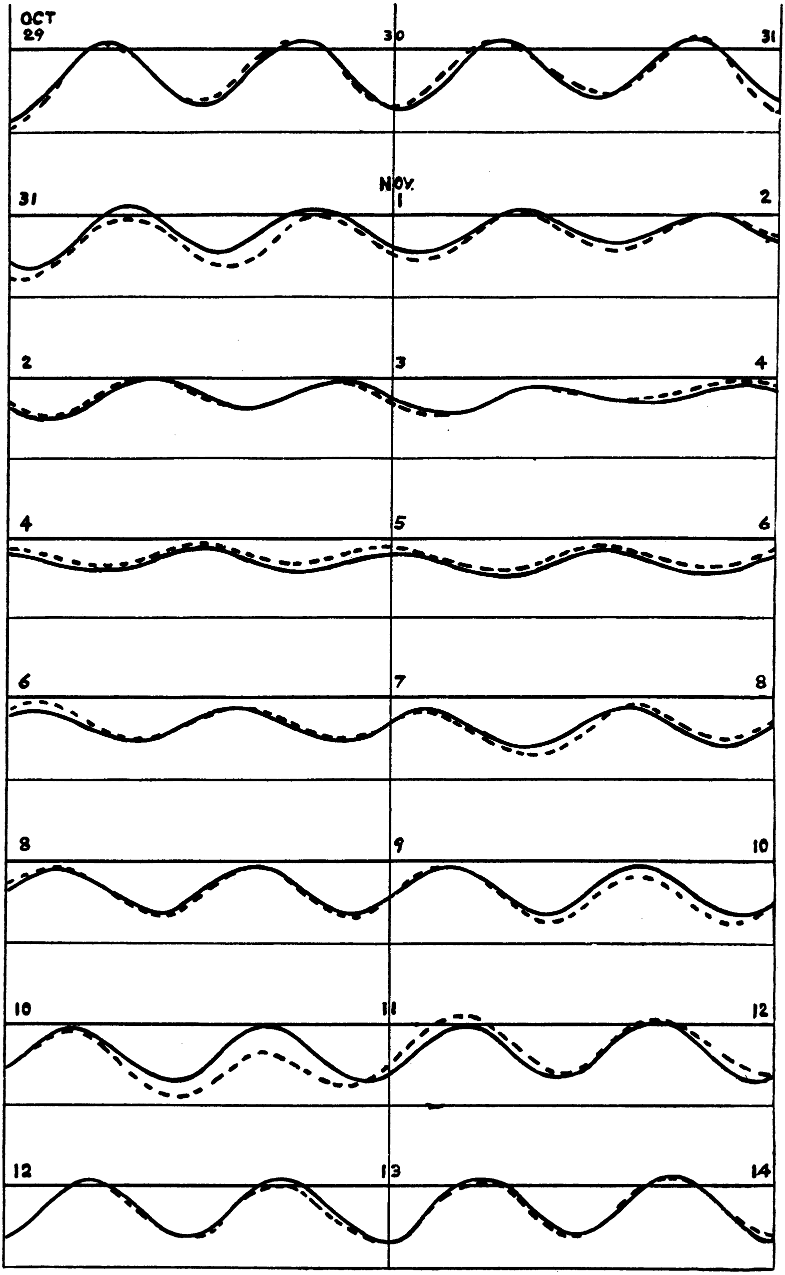

FIG. 11.—N.-S. Dotted curve, observed values; full curve, 0.5 of calculated

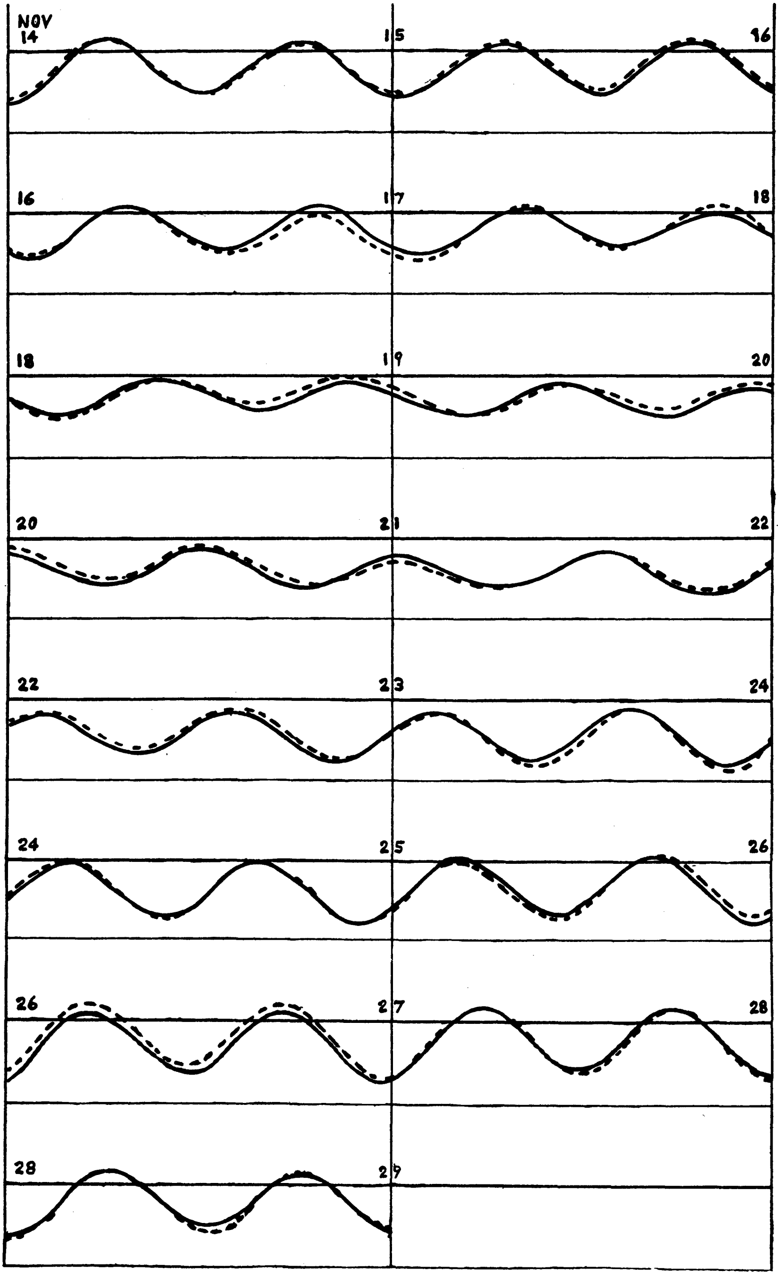

FIG. 12.—N.-S. Dotted curve, observed values; full curve, 0.5 of calculated

The resulting mean of all observations, for this method of grouping, is that the observed amplitude of the oscillation for the E.-W. line is 0.709 of that calculated on the assumption of absolute rigidity; while for the N.-S. line it is 0.510. The acceleration of phase of the observed oscillations relative to the calculated is $+0^{h}.059$ for the E.-W. line and $-0^{h}.007$ for the N.-S. line. The graphs of the final means of all the observations and the calculated values are reproduced in Figs. 13 and 14.

The curves correspond very closely with the following formulae:

$$\text{E.-W.}\quad y=-a\sin\frac{2\pi}{T}(t-\tau)+b$$

$$\text{N.-S.}\quad y=-a\cos\frac{2\pi}{T}(t-\tau)+b$$

with the following values for the constants:

E.-W.

Calculated × 0.7	Observed
$a=20.56$	$a=20.30$
$\tau=0.99$	$\tau=0.88$
$b=0.33$	$b=0.30$

N.-S.

Calculated × 0.5	Observed
$a=13.18$	$a=13.60$
$\tau=0.99$	$\tau=0.97$
$b=0.16$	$b=0.13$

Accordingly the ratio of the observed to the calculated amplitude for E.-W. is 0.691, and for N.-S. is 0.516, while the phase accelerations are $0^{h}.11$ and $0^{h}.02$ respectively.

These last results are slightly different from the preceding. The preference is for the latter as regards amplitude ratios, but these give relatively too much weight to the large oscillations in deducing the phase-difference, and for these the former results are preferred.

Multiplying the second set of values obtained for the amplitude ratios by the factors given above, 1.028 for E.-W. and 1.014 for N.-S., the final results are:

Amplitude Ratio		Phase Acceleration	
E.-W.	**0.710**	**E.-W.**	**+0.059 hour**
N.-S.	**0.523**	**N.-S.**	**−0.007 hour**

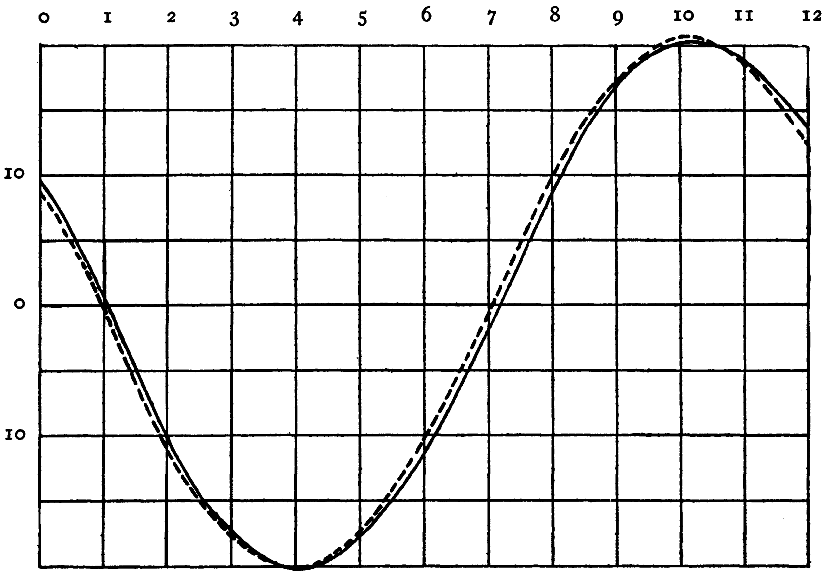

FIG. 13.—Mean of all observations, semi-diurnal Lunar tide. Dotted curve, observed values; full curve, 0.7 of calculated.

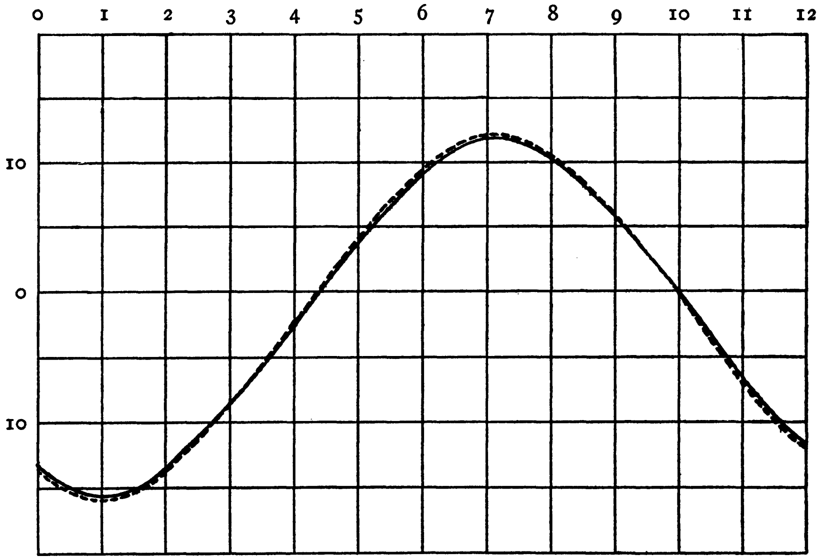

FIG. 14.—Mean of all observations, semi-diurnal Lunar tide. Dotted curve, observed values; full curve, 0.5 of calculated.

It is estimated that the errors in the amplitude ratios are under 1 per cent. The phase acceleration is probably correct to within $0^{h}.03$, but is so small as to leave some doubt as to whether or not it is real.

The disagreement between the E.–W. and N.–S. directions has been interpreted by Hecker, who found a similar difference, as indicating an actual difference in the earth's rigidity in the E.–W. and N.–S. directions.

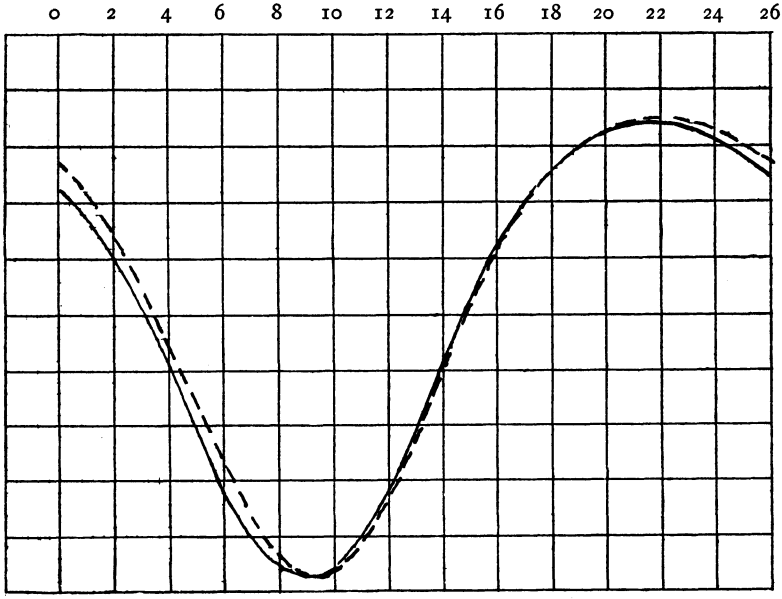

FIG. 15.—E.–W. Mean of observations of diurnal Lunar tide. Dotted curve, observed values; full curve, 0.7 of calculated.

Schweydar agrees with A. E. H. Love in attributing the difference to the effect of ocean tides, and shows on the assumption of an ocean covering the earth uniformly to a depth of 5000 meters that the tides have the effect of increasing the elastic earth tides, so that the ratio of the observed amplitudes to the theoretical is diminished by something like 40 per cent.

The mean values of the ratio adopted by Schweydar are 0.61 for E.–W. and 0.46 for N.–S., which should therefore be increased to 0.85 and 0.64 respectively. A similar correction applied to the results of these experiments would give, instead of 0.71 and 0.52, the values 0.99 and 0.73. The E.–W. value would mean that the earth's rigidity is practically infinite, and it is undoubtedly too high.

The ocean is, however, anything but uniform in depth, and this and the irregularities in coast lines, make an accurate calculation of the disturbing effect of the ocean tides almost impossible. Accordingly Schweydar, considering that the results furnished by the consideration of the semi-diurnal tides is not reliable, investigated the problem of the diurnal period, especially that corresponding to the "declination tide" whose period is $25^{\mathrm{h}}.812$. The dynamical theory shows that for an ocean entirely covering the earth, such tides should vanish; a result which is approximately true, at least for the Atlantic.

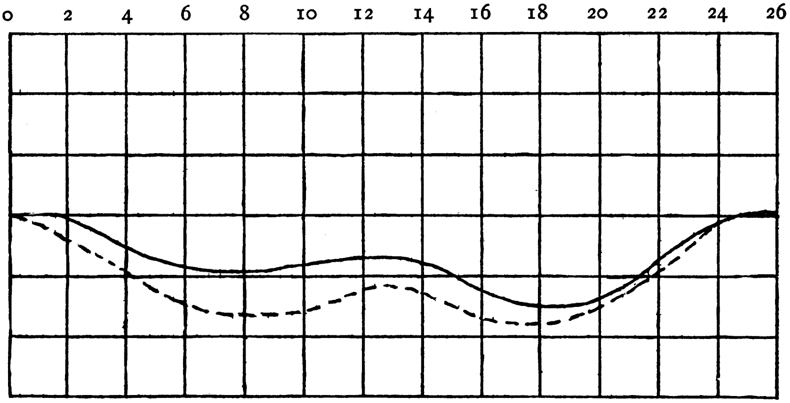

FIG. 16.—N.–S. Mean of observations of diurnal Lunar tide. Dotted curve, observed values; full curve, 0.5 of calculated.

This analysis applied to Hecker's observations gives 0.85, as the value of the ratio, which, it will be noticed, agrees with the value for the semi-diurnal period when corrected for the calculated perturbation of the ocean tides.

The result of grouping the present observations into six groups of two periods each (of $25^{\mathrm{h}}.81$) is reproduced in the graphs of Figs. 15 and 16.

These were analyzed by means of the harmonic analyzer, and gave the following results, in which R is the ratio of the observed amplitude to the calculated, and ϕ the phase acceleration:

	R	ϕ
E.-W.	0.72	−0.4 hour.
N.-S.	0.66	+1.0 "

It appears therefore that the diurnal period gives for the amplitude ratios numbers which are decidedly in better agreement than those furnished by the semi-diurnal period.

It is to be noted that while the agreement between the E.-W. and the N.-S. results is considerably improved, the value of R for the E.-W. direction has not been altered, whereas according to Schweydar's investigation it should have been much larger (0.90 or more). It may be, however, that first, in consequence of the smaller number of periods entering the calculation, and secondly, on account of the smaller value of the resulting amplitude (41:100), these numbers have a considerably larger probable error than that of the semi-diurnal period.

Possibly a closer analysis of the actual ocean tides would show that the effect is small for the E.-W. direction, while in the N.-S. direction it may be considerable.

Regarding the acceleration of phase, it may be noted that the difference between the E.-W. and the N.-S. direction is much greater for the diurnal period than for the semi-diurnal, whereas, if the results of the latter were seriously affected by the ocean tides, the reverse should hold. The mean of the semi-diurnal accelerations is $0^{h}.03$, a quantity so small that it is within the probable error. Taking this value together with 0.70 as the ratio of the observed to the calculated amplitudes, the corresponding values of the earth's rigidity n and viscosity ϵ are:

$$n = 8.6 \times 10^{11} \text{ c.g.s.}$$
$$\epsilon = 10.9 \times 10^{16} \text{ c.g.s.}$$

This calculation is based on the assumption of uniform rigidity throughout the body of the earth, a condition which is certainly not fulfilled; and that as the time increases in arithmetical progression the stresses diminish in geometrical progression. It is clear, however, that the earth's rigidity is greater than that of steel. If the ocean tides have the effect of diminishing the ratio *R* by from $\frac{1}{2}$ to $\frac{1}{3}$, as admitted by Schweydar, the rigidity is enormously greater.

The viscosity is also very great and probably of the same order of magnitude as that of steel.

The main object of this investigation was to demonstrate the feasibility of the method and to determine the order of magnitude of the earth's rigidity and viscosity. Evidently the method is capable of giving results of a high order of accuracy by recording a much longer series of observations. Such a series, in which the microscope will be replaced by the interferometer and in which the record is to be made automatic, is now in preparation. It is expected that the results will furnish a record of the earth tides which will be correct to within a tenth of 1 per cent.

Whether it may thereby be possible to obtain a more accurate value of the coefficients of rigidity and of viscosity will depend on the advance which may be made in the theory of the ocean tides and of their perturbing action. Doubtless it would be of importance to repeat the experiments at widely different stations, some in the southern hemisphere, some on islands in mid-ocean, and some on the continent as far as possible from the coast.

It may also be possible by a comparison of the moon and the sun tides to obtain an independent and perhaps more accurate value of the moon's mass.[1]

The conclusions from these and similar experiments and observations, including precession and variation of latitude, all agree substantially in refuting the old notion that the internal temperature, sufficiently high to melt most of the materials constituting the earth's crust, necessarily involves a fluid or semi-fluid earth supporting a relatively thin solid crust.

From the definitely ascertained result that the coefficient of rigidity and the coefficient of viscosity are both very large (of the order of, and perhaps exceeding, those of solid steel, whereas under normal pressure all substances at this temperature would be fluid), it follows that pressure increases the rigidity and the viscosity, at least of the substances which form the body of the earth.

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[1] It would probably be necessary to make use of a tunnel sufficiently deep to eliminate the thermal effect, which even in the semi-diurnal period would be appreciable.

It would be interesting to confirm this important conclusion, even qualitatively, by experiments on the effect of such relatively small pressures as we are able to obtain in the laboratory.

Such experiments are now in progress; and while the highest pressures obtainable are a thousand times smaller than the pressure in the interior of the earth, it may be stated that there are distinct indications of an increase in the coefficient of rigidity, and a marked increase in the coefficient of viscosity of the few materials thus far investigated.

I would take this opportunity of expressing my appreciation of the interest taken in this work by Professor T. C. Chamberlin, at whose instigation the investigation was undertaken, and of tendering thanks to him and to President H. P. Judson for their efforts in securing the necessary funds. I would also gratefully acknowledge the friendly co-operation of Professor Frost and the members of the staff of the Yerkes Observatory.

TABLE III 10(E.−W.+C.)

A.M. September 27	A.M. September 30	P.M. October 2	A.M. October 5	A.M. October 8
C=+1.30	12:12 − 0.6	4:10 − 1.3	11:32 ± 0.0	6:29 + 0.7
	2:12 − 3.6	5:08 − 1.0	1:02 + 0.9	7:03 + 0.2
8:16 + 1.6	3:12 − 4.1	6:08 + 0.7	2:46 + 1.0	8:08 − 0.9
9:11 + 0.7	4:14 − 2.8	7:14 + 1.8	4:04 + 1.1	9:06 − 1.0
10:12 − 0.8	5:12 − 1.3	8:11 + 3.4	5:17 + 0.9	10:22 − 1.5
11:16 − 2.4	6:18 + 0.6	9:09 + 3.9	6:07 + 1.2	11:14 − 0.8
11:56 − 2.7	7:18 + 2.3	10:31 + 4.2	8:08 + 1.9	12:14 − 0.5
1:10 − 3.3	8:20 + 3.1	11:30 + 3.0	9:22 + 2.9	1:08 − 0.3
2:10 − 3.2	9:56 + 3.0	12:30 + 2.0	10:27 + 3.9	2:08 + 0.4
3:15 − 2.1	11.02 + 1.5	2:02 − 1.2	12:06 + 4.4	3:10 + 0.8
4:06 − 0.1	12:04 − 0.3	3:18 − 2.6	2:24 + 3.6	4:06 + 1.7
5:14 + 0.6	1:12 − 2.3	4:14 − 3.6	4:11 + 2.1	5:09 + 2.1
5:48 + 1.8	2:20 − 3.1	6:40 − 3.3	6:31 ± 0.0	5:53 + 2.2
7:08 + 2.5	3:20 − 3.0	7:58 − 1.8	8:34 − 1.1	7:05 + 2.7
8:16 + 2.5	4:14 − 2.2	9:10 ± 0.0	9:18 − 0.8	8:06 + 1.7
9:19 + 1.2	5:10 − 0.8	10:20 + 1.0	**C= +3.00**	9:22 + 1.1
10:26 − 0.4	5:52 + 0.8	11:10 + 1.5		10:35 + 1.1
11:12 − 1.8	7:11 + 3.4	12:06 + 2.2	10:18 − 0.7	12:23 + 0.8
12:14 − 2.8	7:53 + 4.2	1:18 + 1.8	11:22 − 0.1	1:54 + 1.7
2.04 − 2.9	10:32 + 3.3	2:14 + 1.1	12:15 + 0.3	4:19 + 2.4
4:04 − 0.8	1:46 − 3.0	3:14 + 0.2	1:23 + 0.9	6:10 + 2.5
6:09 + 2.8	3:31 − 3.9	4:15 − 0.2	2:16 + 1.2	7:10 + 1.9
9:30 + 1.8	4:21 − 3.7	5:06 − 0.2	3:18 + 1.6	8:02 + 1.2
10:26 + 0.4	5:28 − 2.6	5:45 + 0.2	4:24 + 1.7	9:12 + 0.1
11:15 − 1.1	6:30 − 0.8	7:09 + 1.7	5:02 + 1.7	10:06 − 0.5
12:22 − 3.0	8:39 + 2.4	8:22 + 3.1	5:54 + 1.9	11:12 − 0.9
1:17 − 4.1	9:48 + 2.7	9:48 + 4.2	7:04 + 1.5	12:08 − 0.7
2:40 − 3.7	11:12 + 2.8	11:14 + 4.4	8:24 + 2.1	1:08 − 0.3
3:33 − 2.4	11:59 + 1.5	12:06 + 3.5	9:18 + 2.5	2:15 + 0.7
4:12 − 1.8	1:38 − 0.9	2:38 + 0.8	10:14 + 2.5	3:06 + 0.7
5:04 + 0.1	3:20 − 1.8	5:42 − 2.1	11:10 + 2.7	4:16 + 2.0
6:12 + 2.1	4:10 − 1.7	8:02 − 1.6	12:05 + 3.1	5:14 + 2.8
7:08 + 2.3	5:13 − 0.6	9:09 − 0.6	2:07 + 3.1	5:54 + 2.9
8:06 + 3.0	5:51 + 0.5	10:10 + 0.8	4:18 + 2.1	7:00 + 2.8
9:08 + 3.0	7:17 + 3.1	11:19 + 1.5	6:19 + 0.6	8:10 + 2.4
10:20 + 1.0	8:05 + 4.3	12:16 + 2.5	7:10 − 0.2	9:22 + 1.5
11:28 − 1.4	9:22 + 5.0	1:22 + 2.2	8:22 − 0.8	10:06 + 1.0
12:20 − 2.5	**C= −1.32**	2:08 + 1.2	9:12 − 1.2	11:12 + 0.3
2:11 − 3.6		3:23 + 0.4	10:16 − 1.0	12:22 + 0.3
4:18 − 1.2	10:12 + 4.7	4:10 + 0.8?	11:14 − 1.1	2:10 + 0.8
8:20 + 3.8	11:14 + 3.2	5:01 + 0.3	12:01 − 1.1	4:25 + 2.5
9:14 + 3.3	12:10 + 1.2	5:58 + 0.7	1:04 − 0.6	6:16 + 3.3
10:08 + 3.1	2:10 − 2.4	7:16 + 2.2	2:08 + 0.3	7:20 + 3.1
11:18 − 0.2	4:16 − 4.6	8:02 + 2.5	3:06 + 0.9	8:13 + 2.0
11:58 − 1.2	6:28 − 3.4	9:06 + 3.5	4:10 + 1.2	9:08 + 1.3
1:19 − 3.0	7:15 − 1.8	10:16 + 4.6	5:08 + 1.7	10:08 + 0.5
2:06 − 3.3	8:22 − 1.4	11:08 + 4.7	6:02 + 1.8	11:10 − 0.7
3:10 − 3.0	9:10 + 0.6	12:12 + 4.4	7:17 + 1.5	11:58 − 1.4
4:20 − 1.2	10:05 + 1.5	2:09 + 2.4	8:08 + 1.4	1:10 − 0.8
5:21 + 0.8	11:12 + 1.6	4:20 + 0.3	9:05 + 1.3	2:10 − 0.5
6:49 + 2.9	12:00 + 1.1	6:39 − 1.1	10:12 + 1.8	3:12 + 0.4
8:32 + 4.4	1:08 + 0.4	7:40 − 1.2	11:11 + 1.7	4:10 + 1.3
9:50 + 3.5	2:21 − 1.0	9:10 − 0.5	12:05 + 1.7	5:12 + 2.3
11:15 + 1.2	3:09 − 1.4	10:33 ± 0.0	2:16 + 1.9	5:59 + 2.8

TABLE III—*Continued*

P.M. October 10	P.M. October 13	A.M. October 16	P.M. October 18	P.M. October 21
6:53 + 2.9	1:18 − 2.9	6:00 − 4.1	6:51 − 2.4	2:12 − 6.7
8:10 + 2.2	2:24 − 2.9	7:13 − 2.4	8:30 − 0.9	3:20 − 6.4
9:18 + 1.4	3:27 − 1.9	8:02 − 1.4	9:52 − 0.2	4:10 − 6.3
10:14 + 0.3	4:14 − 1.0	9:06 − 0.7	11:00 − 0.7	5:04 − 6.4
11:14 − 0.8	5:11 + 0.2	10:10 − 1.0	12:00 − 1.7	6:00 − 6.0
12:34 − 1.1	5:59 + 1.3	11:06 − 1.8	2:05 − 5.3	7:00 − 5.9
1:50 − 1.1	6:52 + 2.2	12:06 − 2.5	4:06 − 7.9	8:02 − 5.8
4:11 + 0.2	8:17 + 2.5	1:14 − 4.0	6:11 − 8.0	9:26 − 5.1
6:12 + 1.7	9:16 + 1.9	2:12 − 4.3	7:16 − 7.3	10:16 − 4.7
7:12 + 2.0	10:12 + 0.7	3:12 − 4.1	8:03 − 6.2	11:10 − 4.2
8:18 + 1.3	11:10 − 1.0	4:14 − 3.6	9:09 − 5.5	12:05 − 4.2
9:08 ± 0.0	12:07 − 2.5	5:18 − 2.6	10:08 − 4.1	1:08 − 3.9
10:18 − 1.0	2:13 − 4.2	6:52 − 0.3	11:03 − 4.0	2:00 − 4.4
11:14 − 2.2	4:16 − 3.4	8:14 + 0.9	2:03 − 4.3	4:11 − 5.5
12:02 − 2.6	6:14 − 0.5	9:09 + 1.1	3:02 − 4.7	6:14 − 7.6
1:10 − 2.8	7:09 + 0.8	10:09 + 0.9	4:04 − 5.2	7:12 − 8.6
2:04 − 2.8	8:21 + 1.3	11:09 − 0.6	5:04 − 5.2	8:13 − 9.0
3:18 − 1.9	9:20 + 0.9	12:12 − 2.3	6:12 − 4.9	9:14 − 9.1
4:06 − 0.7	10:10 + 0.4	2:14 − 5.4	7:58 − 3.1	10:10 − 8.6
5:01 + 0.4	11:04 − 0.8	4:26 − 6.6	9:15 − 1.9	11:08 − 8.5
5:51 + 1.3	12:01 − 2.1	6:06 − 5.0	10:08 − 1.8	12:00 − 7.8
6:56 + 1.8	1:06 − 2.7	7:14 − 3.4	11:02 − 1.8	1:09 − 7.2
8:11 + 1.6	2:17 − 3.3	8:10 − 2.5	12:06 − 2.7	2:11 − 6.6
9:26 + 0.4	3:09 − 2.3	9:04 − 1.7	2:10 − 5.0	3:05 − 6.3
10:15 − 0.7	4:08 − 1.7	10:00 − 1.6	4:12 − 7.9	4:04 − 6.2
11:10 − 2.1	5:02 − 0.6	11:05 − 2.0	6:55 − 8.9	5:07 − 6.1
12:11 − 3.1	5:41 + 0.3	12:00 − 2.8	8:12 − 8.0	6:44 − 6.3
2:12 − 3.2	7:03 + 2.0	1:08 − 3.5	9:10 − 7.4	8:01 − 6.3
4:05 − 1.5	8:06 + 2.7	1:54 − 4.1	10:16 − 6.5	9:03 − 6.5
6:10 + 0.7	9:05 + 2.4	3:20 − 4.9	11:10 − 6.3	10:08 − 6.3
7:40 + 1.1	10:06 + 0.9	4:10 − 4.4	12:02 − 6.0	12:09 − 5.3
8:46 + 0.6	11:02 − 0.5	5:10 − 3.5	1:07 − 6.5	1:56 − 4.9
9:46 − 1.0	12:05 − 2.6	5:49 − 2.7	2:08 − 6.8	4:08 − 4.9
10:52 − 1.3	3:31 − 5.2	7:14 − 0.9	3:17 − 7.1	6:06 − 6.5
11:53 − 2.3	5:10 − 4.5	8:10 + 0.2	4:07 − 7.1	7:21 − 7.9
12:51 − 2.8	6:39 − 1.3	9:08 + 0.7	5:06 − 7.3	8:34 − 8.7
2:10 − 2.8	8:18 ± 0.0	10:23 + 0.3	5:53 − 7.0	9:26 − 9.1
2:52 − 2.3	9:11 + 0.2	11:20 − 0.6	6:58 − 6.6	10:16 − 8.8
4:01 − 1.0	10:12 − 0.2	12:20 − 2.6	8:08 − 6.1	11:09 − 8.4
5:06 + 0.2	11:05 − 0.8	2:06 − 5.3	9:16 − 4.7	11:56 − 7.8
6:21 + 1.8	12:04 − 1.8	5:00 − 7.6	10:20 − 4.6	1:07 − 7.0
8:12 + 2.0	1:08 − 2.7	5:58 − 7.2	11:16 − 4.1	2:07 − 6.2
9:22 + 0.9	2:03 − 3.3	7:06 − 6.1	12:09 − 4.3	3:26 − 5.7
10:06 − 0.2	3:15 − 3.3	8:05 − 5.0	2:13 − 5.8	4:12 − 5.3
11:17 − 2.0	4:10 − 2.5	9:08 − 3.7	4:23 − 7.8	5:00 − 5.2
12:14 − 3.4	5:08 − 1.3	10:06 − 2.9	6:28 − 9.8	5:46 − 5.1
1:58 − 4.1	5:49 − 0.5	11:10 − 2.8	7:56 − 10.0	7:00 − 5.6
4:26 − 2.2	7:37 + 1.8	12:02 − 2.8	9:02 − 10.1	8:00 − 6.1
6:59 + 0.9	8:48 + 2.1	1:18 − 3.4	10:12 − 9.8	9:16 − 6.7
8:14 + 1.4	10:12 + 1.2	2:15 − 4.4	C= + 1.30	10:18 − 6.8
9:11 + 1.1	11:16 − 0.6	3:11 − 4.0		11:07 − 6.8
10:13 + 0.2	12:03 − 2.2	4:04 − 4.4	11:21 − 8.7	12:24 − 6.3
11:10 − 1.1	2:06 − 5.4	4:58 − 4.1	12:04 − 7.6	2:03 − 5.2
12:10 − 1.8	4:16 − 6.0	5:48 − 3.7	1:08 − 7.1	4:19 − 4.1

TABLE III—*Continued*

A.M. October 24	P.M. October 26	A.M. October 29	A.M. November 1	P.M. November 3
6:06 − 5.3	6:29 − 2.8	9:10 − 4.2	12:42 − 5.3	2:11 − 4.2
7:07 − 6.2	8:05 − 3.6	10:08 − 5.0	2:20 − 8.3	3:15 − 4.3
8:11 − 7.3	9:17 − 5.1	11:12 − 6.0	4:12 − 9.9	4:10 − 3.8
9:08 − 8.2	10:16 − 6.9	12:08 − 6.9	6:06 − 9.3	5:12 − 3.7
10:05 − 9.1	12:11 − 9.6	1:10 − 8.1	7:12 − 8.8	5:50 − 3.8
11:04 − 9.3	2:02 − 9.8	2:14 − 8.0	**C = −2.64**	6:52 − 3.6
11:55 − 8.6	4:10 − 7.2	3:18 − 7.5		8:16 − 2.3
1:09 − 7.9	6:00 − 4.5	4:13 − 6.2	8:08 − 7.3	9:19 − 1.7
2:10 − 6.5	7:20 − 4.2	5:08 − 4.7	9:04 − 5.6	10:20 − 0.9
3:04 − 5.6	8:16 − 4.4	5:51 − 3.5	10:15 − 5.0	11:14 − 0.7
4:08 − 4.5	9:21 − 5.4	6:58 − 1.8	11:16 − 4.6	12:10 − 0.4
5:05 − 4.1	10:15 − 6.4	8:08 − 1.2	12:02 − 4.8	2:17 − 1.5
5:56 − 3.8	11:07 − 7.6	9:24 − 1.5	1:06 − 5.0	**C = −1.84**
6:56 − 4.4	12:02 − 8.6	10:21 − 2.9	2:09 − 5.9	
8:12 − 5.1	1:00 − 9.0	11:16 − 5.0	3:15 − 6.1	4:16 − 2.9
9:04 − 6.0	2:16 − 8.4	12:14 − 6.9	4:16 − 6.3	6:17 − 4.6
10:10 − 6.9	3:12 − 7.1	2:15 −10.7	5:20 − 6.0	7:19 − 5.2
11:16 − 7.5	4:16 − 5.5	4:16 −10.8	5:53 − 5.3	8:18 − 5.2
12:23 − 7.2	5:14 − 3.5	6:14 − 8.2	6:54 − 4.1	9:11 − 4.9
2:06 − 6.2	5:52 − 2.6	7:14 − 7.0	8:12 − 2.4	10:13 − 4.9
4:16 − 4.2	6:49 − 2.0	9:16 − 5.4	9:14 − 1.2	11:16 − 4.1
6:16 − 3.5	8:15 − 2.0	12:09 − 7.0	10:17 − 1.0	12:04 − 4.1
7:13 − 4.4	9:09 − 3.3	1:08 − 8.0	11:21 − 1.3	1:11 − 3.4
8:10 − 5.5	10:08 − 4.9	2:05 − 8.7	12:36 − 2.6	2:16 − 3.0
9:25 − 6.7	11:12 − 7.3	3:16 − 8.3	2:19 − 5.1	3:17 − 2.7
10:22 − 7.6	12:08 − 9.1	4:15 − 7.3	4:17 − 7.4	3:28 − 2.2
11:14 − 7.9	2:13 −10.5	5:08 − 6.2	6:14 − 8.3	4:18 − 2.6
12:01 − 7.9	4:12 − 8.3	5:56 − 4.6	8:17 − 6.1	5:07 − 2.6
1:08 − 7.2	6:49 − 4.2	6:58 − 3.3	9:19 − 5.5	5:54 − 2.3
2:10 − 6.1	7:30 − 3.8	8:13 − 1.6	10:17 − 4.8	6:50 − 1.8
3:20 − 4.5	8:18 − 3.5	9:18 − 1.6	11:10 − 4.3	8:05 − 1.7
4:19 − 3.6	9:06 − 3.6	10:18 − 2.3	12:15 − 4.2	9:14 − 1.5
5:09 − 2.7	10:06 − 4.4	11:20 − 3.7	1:18 − 4.2	10:09 − 1.1
5:53 − 2.4	11:07 − 5.4	12:33 − 6.0	2:25 − 5.0	11:10 − 0.6
7:08 − 2.7	12:02 − 7.0	2:16 − 9.4	3:15 − 4.7	12:23 − 0.3
8:02 − 3.7	1:14 − 7.6	4:16 −10.6	4:14 − 4.7	2:12 − 0.6
9:13 − 5.0	**C = +0.90**	6:25 − 8.9	5:18 − 4.5	4:11 − 1.7
10:17 − 6.7		7:18 − 7.9	6:24 − 3.5	6:12 − 3.4
11:12 − 7.5	3:06 − 8.8	8:27 − 6.5	8:04 − 2.4	7:12 − 3.7
12:02 − 7.9	3:48 − 7.9	9:34 − 5.8	9:16 − 1.2	8:15 − 4.1
2:19 − 7.0	4:46 − 5.7	10:17 − 5.6	10:06 − 0.7	9:16 − 4.6
4:12 − 4.5	5:20 − 4.4	11:12 − 6.0	11:09 − 0.9	10:27 − 4.4
6:14 − 3.1	5:49 − 3.2	12:04 − 6.3	12:16 − 1.4	11:08 − 4.5
7:14 − 3.6	6:54 − 2.2	1:05 − 7.0	2:17 − 3.2	12:04 − 3.6
8:16 − 4.3	8:07 − 1.7	2:29 − 7.5	4:38 − 5.6	1:12 − 2.7
9:16 − 5.9	9:06 − 2.7	3:31 − 7.2	6:24 − 6.5	2:12 − 2.4
10:15 − 7.3	10:10 − 4.2	4:20 − 7.1	8:19 − 5.9	3:10 − 1.6
11:13 − 8.7	11:19 − 6.4	5:13 − 6.0	**C = −0.84**	4:04 − 0.9
12:09 − 9.2	12:18 − 8.4	5:56 − 4.9		5:04 − 0.9
1:14 − 8.9	2:11 −10.5	6:52 − 3.6	9:26 − 5.7	5:52 − 1.4
2:28 − 8.1	4:08 −10.1	8:22 − 2.0	10:10 − 5.0	6:51 − 1.3
3:27 − 6.7	6:10 − 6.7	9:19 − 1.3	11:12 − 4.7	8:00 − 1.5
4:14 − 5.5	7:18 − 4.9	10:10 − 1.8	12:06 − 4.2	9:45 − 1.7
5:21 − 3.5	8:18 − 4.2	11:30 − 2.8	1:08 − 4.4	11:04 − 1.4

TABLE III—*Continued*

A.M. November 6	P.M. November 8	A.M. November 11	P.M. November 13	P.M. November 16
1:04 − 0.9	12:06 − 3.0	8:27 + 0.4	8:00 + 5.8	1:17 + 1.5
2:19 − 0.1	1:05 − 2.4	9:23 − 0.6	9:10 + 5.4	2:30 + 1.1
4:19 − 0.7	2:13 − 1.4	10:14 − 1.6	10:07 + 4.0	3:17 + 1.0
6:17 − 1.8	3:14 − 0.5	11:10 − 2.4	11:08 + 2.2	4:06 + 1.2
7:12 − 1.7	4:18 + 0.7	12:04 − 2.8	12:08 + 0.3	5:12 + 2.3
8:04 − 2.7	5:10 + 0.8	1:04 − 2.7	2:10 − 2.5	6:24 + 4.2
9:05 − 3.5	5:55 + 1.5	1:55 − 2.6	4:16 − 2.6	8:00 + 5.7
10:07 − 4.3	6:55 + 1.6	3:08 − 1.0	6:38 + 0.1	9:17 + 6.4
11:07 − 3.9	8:03 + 0.9	4:18 + 0.7	8:06 + 1.7	10:16 + 6.7
12:07 − 3.5	9:11 − 0.3	5:11 + 1.9	9:13 + 2.3	11:06 + 6.1
1:19 − 2.8	10:10 − 1.2	5:56 + 3.1	10:10 + 2.0	12:19 + 4.5
2:12 − 1.8	11:18 − 2.3	6:59 + 3.8	11:09 + 1.5	2:07 + 1.8
3:08 − 1.5	12:20 − 2.6	8:10 + 3.8	12:07 + 0.8	4:38 − 1.4
4:06 − 0.2	2:10 − 1.8	9:11 + 2.3	1:08 − 0.4	7:22 − 0.1
5:06 ± 0.0	4:17 − 0.1	10:12 + 0.8	2:01 − 0.4	8:15 + 0.5
5:50 − 0.2	6:18 + 1.0	11:10 − 0.7	3:09 + 0.5	9:10 + 1.5
6:48 − 0.4	7:08 + 1.0	12:32 − 2.6	4:09 + 1.3	10:12 + 2.4
7:59 − 0.9	8:15 + 0.2	2:08 − 3.4	5:06 + 2.6	11:14 + 2.8
9:08 − 0.9	9:16 − 0.6	4:10 − 2.5	5:56 + 3.5	12:10 + 2.6
10:10 − 1.8	10:16 − 1.9	6:28 + 0.8	6:50 + 4.6	1:07 + 2.5
11:08 − 1.7	11:16 − 2.4	7:24 + 1.4	8:12 + 6.1	2:10 + 1.8
12:14 − 1.4	1:13 − 2.7	8:16 + 1.3	9:12 + 5.8	3:15 + 1.7
1:11 − 0.8	2:29 − 1.5	9:18 + 0.8	10:20 + 5.1	4:03 + 1.6
2:10 − 0.3	3:27 − 0.3	10:14 + 0.1	11:14 + 3.9	5:05 + 2.3
4:18 + 0.4	4:36 + 1.3	11:18 − 1.0	12:04 + 2.3	5:52 + 2.6
6:12 − 0.3	5:25 + 1.8	12:08 − 1.4	2:11 − 1.9	7:12 + 3.9
7:12 − 0.7	6:13 + 2.1	1:08 − 1.7	4:16 − 2.4	8:08 + 4.8
8:08 − 1.1	8:25 + 1.4	2:12 − 1.7	6:08 − 0.6	**C = +2.66**
9:13 − 2.4	9:18 − 0.1	3:10 − 0.7	7:58 + 1.8	
10:09 − 2.5	10:18 − 1.1	4:04 + 1.1	9:06 + 2.6	9:16 + 5.7
11:05 − 3.3	11:20 − 2.6	5:05 + 2.8	10:18 + 2.5	10:09 + 6.3
12:04 − 3.0	12:20 − 3.3	6:00 + 3.7	11:08 + 2.3	11:09 + 6.4
1:07 − 2.2	2:04 − 3.2	7:05 + 4.7	12:04 + 1.7	12:12 + 5.7
2:22 − 1.3	4:08 − 0.3	8:08 + 4.9	1:12 + 1.1	2:08 + 3.4
3:12 − 0.7	6:04 + 1.1	9:17 + 3.9	2:16 + 0.6	4:12 + 0.4
4:17 + 0.3	8:20 + 1.0	10:08 + 3.0	3:16 + 0.7	6:13 − 0.2
C = −2.83	9:32 − 0.2	11:08 + 1.0	4:11 + 0.8	7:30 ± 0.0
	10:51 − 1.5	12:15 − 1.0	5:16 + 2.4	8:23 + 0.9
5:12 + 0.5	12:07 − 2.4	2:27 − 3.2	5:57 + 3.5	9:19 + 1.7
5:56 + 1.0	1:10 − 2.2	4:18 − 2.0	6:51 + 4.7	10:14 + 2.1
6:52 + 1.1	2:08 − 1.4	6:12 − 0.1	8:17 + 6.4	11:10 + 2.4
7:48 + 0.2	3:08 − 0.2	7:30 + 1.6	9:13 + 6.4	12:03 + 3.1
9:16 − 0.4	4:20 + 1.3	8:26 + 2.2	10:08 + 6.3	1:12 + 3.2
10:10 − 1.7	5:16 + 2.9	9:23 + 2.0	11:05 + 5.2	2:08 + 3.0
11:13 − 2.0	5:52 + 2.9	10:12 + 1.3	12:18 + 3.1	3:05 + 2.0?
12:13 − 2.1	6:52 + 3.3	11:06 + 0.5	2:06 − 0.1	4:04 + 2.7
2:44 − 0.9	9:01 + 1.6	12:06 ± 0.0	4:22 − 1.9	5:04 + 3.4
4:24 + 0.1	10:10 + 0.4	1:03 − 0.7	6:14 − 0.8	5:53 + 3.1
6:13 + 0.2	11:13 − 1.3	2:04 − 0.6	7:12 + 0.2	6:49 + 4.0
7:22 − 0.3	12:26 − 3.4	3:12 + 0.3	8:12 + 0.9	8:08 + 5.3
8:16 − 1.1	2:10 − 3.7	4:10 + 1.3	9:09 + 1.7	9:24 + 6.2
9:12 − 1.6	4:18 − 1.8	5:15 + 2.8	10:13 + 2.5	10:11 + 6.9
10:10 − 2.3	6:14 + 0.5	5:58 + 4.0	11:10 + 2.4	11:10 + 7.4
11:09 − 3.1	7:20 + 0.8	6:50 + 4.8	12:15 + 2.2	12:11 + 7.3

TABLE III—*Continued*

A.M. November 19	A.M. November 21	A.M. November 23	A.M. November 25	A.M. November 27
2:14 + 5.8	4:12 + 6.8	6:12 + 7.0	10:06 + 4.8	11:06 + 6.3
4:15 + 3.7	6:04 + 4.8	7:11 + 6.1	11:04 + 3.8	12:08 + 5.5
6:16 + 1.7	7:15 + 4.0	8:10 + 5.1	12:06 + 3.4	12:48 + 5.2
7:16 + 1.3	8:12 + 3.4	9:10 + 3.9	1:05 + 3.6	2:05 + 4.9
8:08 + 1.3	9:09 + 3.1	10:12 + 3.2	2:05 + 4.4	3:17 + 6.2
9:21 + 2.0	10:08 + 3.2	11:08 + 2.9	3:09 + 5.9	4:17 + 7.4
10:12 + 2.4	11:12 + 3.5	12:08 + 3.4	4:10 + 7.6	5:12 + 9.1
11:08 + 3.0	12:06 + 4.3	1:12 + 4.4	5:08 + 9.0	6:17 +10.6
12:12 + 3.7	1:09 + 5.4	2:18 + 6.0	5:55 + 9.7	7:30 +11.9
1:23 + 4.0	2:10 + 6.3	3:08 + 7.1	6:54 +10.0	8:16 +11.8
2:25 + 4.1	3:03 + 7.4	4:07 + 8.4	8:10 + 8.8	9:28 +11.0
3:12 + 4.2	4:09 + 7.8	5:03 + 8.6	9:08 + 7.7	10:18 + 9.6
4:14 + 4.1	5:14 + 7.8	6:08 + 8.7	10:05 + 6.0	11:08 + 7.9
5:13 + 4.1	5:50 + 7.2	8:02 + 6.9	11:08 + 4.0	12:09 + 5.9
5:50 + 4.0	6:53 + 6.6	9:06 + 5.1	12:08 + 2.5	2:03 + 2.7
7:06 + 4.3	8:06 + 5.6	10:09 + 3.8	2:10 + 1.1	3:52 + 2.4
8:11 + 4.4	9:16 + 5.1	1:15 + 2.8	4:05 + 2.8	5:35 + 4.1
9:19 + 5.3	10:14 + 5.0	3:07 + 4.5	5:56 + 5.7	6:37 + 5.6
10:12 + 5.7	11:14 + 5.3	5:06 + 6.5	7:18 + 6.9	8:19 + 7.4
11:05 + 6.3	12:12 + 5.6	7:11 + 6.4	8:20 + 7.1	9:06 + 7.6
12:16 + 6.8	2:34 + 6.8	8:18 + 5.6	9:18 + 6.4	10:04 + 7.6
2:09 + 5.9	4:10 + 7.3	9:18 + 4.4	10:16 + 5.7	11:06 + 7.2
4:12 + 4.5	6:10 + 6.2	10:07 + 3.6	11:09 + 4.7	12:06 + 6.2
6:07 + 2.7	7:20 + 5.1	11:14 + 3.1	12:06 + 4.1	1:07 + 5.7
7:14 + 1.9	8:12 + 4.3	12:04 + 2.9	1:02 + 3.9	2:08 + 5.2
8:08 + 1.6	9:08 + 3.5	1:10 + 3.6	2:06 + 4.7	3:16 + 5.8
9:22 + 1.8	10:14 + 3.2	2:07 + 4.8	3:10 + 6.0	4:08 + 6.6
10:18 + 2.1	11:09 + 3.3	3:19 + 6.9	4:08 + 7.4	5:05 + 7.9
11:09 + 2.9	12:02 + 3.7	4:14 + 8.3	5:06 + 9.3	5:48 + 9.0
12:09 + 3.4	1:09 + 4.9	5:09 + 9.4	6:60 +10.3	6:56 +10.8
1:05 + 4.3	2:14 + 5.9	6:00 + 9.6	6:52 +11.0	7:54 +11.8
2:04 + 4.7	3:18 + 7.4	6:54 + 9.2	8:02 +11.0	8:44 +11.9
3:07 + 5.3	4:14 + 8.0	8:12 + 8.3	9:10 +10.0	10:03 +11.2
4:05 + 5.2	5:08 + 8.4	9:10 + 6.8	10:12 + 8.1	12:00 + 7.8
5:03 + 5.3	5:52 + 8.2	10:13 + 5.1	11:18 + 5.9	3:15 + 2.6
5:56 + 4.9	6:48 + 7.5	11:05 + 3.4	12:36 + 3.4	5:16 + 3.0
6:56 + 4.8	8:02 + 6.5	12:08 + 2.2	2:08 + 1.8	7:06 + 5.3
8:04 + 4.8	9:20 + 5.1	2:12 + 2.5	4:26 + 3.1	8:21 + 6.9
9:08 + 5.2	10:06 + 4.3	4:16 + 4.7	6:04 + 5.2	9:30 + 7.8
10:14 + 5.4	11:17 + 3.7	6:10 + 6.9	7:16 + 6.7	10:48 + 7.5
11:07 + 6.0	12:18 + 4.1	7:20 + 6.9	8:21 + 7.5	12:03 + 7.0
12:12 + 6.6	2:12 + 5.6	8:24 + 6.4	9:18 + 7.4	1:22 + 6.2
2:06 + 7.2	4:12 + 7.0	9:14 + 5.6	10:04 + 7.0	2:18 + 6.0

TABLE IV 10(S.−N.+C.)

A.M. September 27	P.M. September 29	P.M. October 2	A.M. October 5	P.M. October 7
C=+0.70	9:36 + 0.8	3:59 − 3.6	9:01 − 6.8	10:01 − 8.1
8:04 + 2.9	11:01 + 1.6	5:01 − 4.6	10:02 − 7.0	11:00 − 8.4
9:00 + 3.2	11:59 + 1.9	5:59 − 5.3	C=−2.30	11:55 − 8.5
10:00 + 3.3	2:00 + 0.9	7:02 − 5.8	11:51 − 6.3	2:06 − 9.0
11:04 + 3.2	3:00 − 0.9	8:00 − 5.5	12:52 − 6.1	6:20 − 7.9
12:06 + 1.9	4:02 − 2.2	8:58 − 4.9	2:37 − 6.8	6:54 − 7.6
12:58 + 0.6	5:02 − 2.8	10:20 − 3.6	3:56 − 7.3	7:56 − 7.6
2:00 − 0.9	6:06 − 2.8	11:17 − 3.2	5:08 − 6.9	8:58 − 7.7
2:58 − 1.8	7:10 − 2.9	12:19 − 2.3	6:18 − 7.4	10:12 − 7.9
3:56 − 3.0	8:09 − 1.9	1:51 − 2.5	7:55 − 8.2	11:06 − 8.5
5:03 − 2.2	9:43 ± 0.0	3:05 − 2.8	9:12 − 8.0	12:06 − 9.2
5:58 − 0.9	10:52 + 0.4	4:04 − 3.6	10:18 − 8.6	1:00 − 9.4
6:54 − 0.1	2:08 − 0.1	6:29 − 5.6	11:55 − 8.7	1:59 − 9.3
8:02 + 0.7	3:10 − 1.9	7:49 − 6.1	2:12 − 8.1	3:01 − 9.1
9:03 + 2.0	4:05 − 3.2	8:58 − 6.2	4:02 − 7.9	3:58 − 9.1
C=+0.80	5:02 − 3.9	10:12 − 5.8	6:20 − 8.2	5:01 − 8.6
10:13 + 2.8	6:04 − 4.2	10:56 − 4.9	8:24 − 8.2	6:00 − 8.4
11:01 + 2.7	6:57 − 3.8	12:16 − 4.1	9:08 − 8.4	6:56 − 7.9
12:02 + 1.9	8:06 − 2.7	1:10 − 3.6	10:09 − 8.8	7:58 − 7.7
1:52 − 0.1	10:20 − 1.0	2:04 − 3.4	11:12 − 8.5	9:15 − 7.6
3:48 − 2.0	1:31 − 0.7	3:04 − 3.5	12:24 − 9.0	10:26 − 7.9
5:56 − 1.2	3:14 − 1.4	4:05 − 4.0	1:15 − 9.1	12:12 − 8.5
9:18 + 1.5	4:06 − 3.2	4:54 − 4.7	2:08 − 9.0	1:45 − 9.1
10:18 + 2.6	5:13 − 4.0	5:58 − 5.2	3:09 − 8.9	4:08 − 9.3
11:04 + 2.5	6:18 − 5.0	6:50 − 5.7	4:04 − 8.5	6:00 − 8.7
12:13 + 1.9	7:24 − 4.7	C=+1.10	C=−1.76	6:58 − 7.6
1:26 + 0.7	8:25 − 3.6	8:08 − 6.0	4:53 − 8.5	7:54 − 7.5
2:32 − 1.3	10:48 − 1.7	9:37 − 5.0	6:04 − 8.0	9:04 − 7.4
3:23 − 2.3	12:10 − 0.9	11:04 − 4.4	6:52 − 8.1	9:56 − 7.9
4:03 − 2.3	1:22 − 1.5	11:56 − 3.8	8:14 − 7.9	11:02 − 8.6
4:54 − 2.5	3:08 − 3.2	2:28 − 3.9	9:08 − 8.1	12:16 −10.0
6:00 − 1.6	4:00 − 3.5	5:33 − 5.1	10:05 − 7.9	12:58 −10.1
6:56 − 0.7	5:04 − 4.3	7:52 − 5.7	10:58 − 8.8	2:23 −10.4
7:54 + 0.6	6:02 − 4.5	8:58 − 6.0	11:55 − 8.9	2:57 −10.5
8:56 + 2.0	7:04 − 5.7?	10:01 − 6.3	1:56 − 8.5	4:07 −10.5
10:04 + 2.5	8:15 − 6.1?	11:11 − 6.7	4:07 − 8.2	5:05 − 9.9
11:12 + 3.4	9:08 − 3.8	12:06 − 5.9	6:09 − 8.0	6:02 − 9.2
12:04 + 2.6	C=+1.92	1:14 − 5.5	6:56 − 7.5	6:52 − 8.7
1:57 − 0.1	10:03 − 2.4	2:00 − 5.2	8:12 − 8.3	8:02 − 7.9
4:06 − 2.0	11:03 − 1.0	3:15 − 4.9	9:04 − 8.1	9:15 − 7.5
8:07 − 0.3	12:00 − 1.0	4:01 − 4.9	10:08 − 8.9	9:58 − 7.3
9:03 + 0.4	1:57 − 1.2	4:53 − 5.3	11:06 − 9.4	11:03 − 7.8
9:58 + 1.6	4:01 − 3.4	5:47 − 5.7	12:12 − 9.6	12:11 − 8.4
11:10 + 1.8	6:14 − 4.7	7:04 − 6.1	12:56 − 9.6	2:00 − 9.5
12:09 + 1.6	7:06 − 5.0	7:53 − 6.1	2:00 − 9.7	4:12 −10.2
1:11 + 0.1	8:12 − 5.3	8:56 − 6.4	2:55 −10.0	6:04 − 9.2
1:56 ± 0.0	9:01 − 5.0	10:04 − 6.7	4:01 − 8.5	7:09 − 8.8
2:58 − 1.4	9:57 − 4.4	10:56 − 6.6	4:56 − 8.6	8:02 − 8.2
4:05 − 2.2	11:06 − 3.7	12:02 − 6.1	5:51 − 8.0	8:58 − 8.0
5:07 − 2.8	12:10 − 2.6	2:00 − 5.7	7:07 − 7.7	10:00 − 8.0
5:52 − 2.3	1:00 − 2.4	4:09 − 5.6	7:58 − 7.5	10:59 − 8.3
7:04 − 2.5	2:12 − 2.3	6:28 − 6.5	8:56 − 7.7	12:11 − 9.3
8:19 − 0.8	3:10 − 3.2	7:30 − 5.9		12:58 −10.0
				1:56 −10.2

TABLE IV—*Continued*

P.M. October 10	A.M. October 13	P.M. October 15	P.M. October 18	P.M. October 21
3:02 −10.4	9:04 − 7.3	11:08 − 6.6	3:04 − 9.3	12:11 −11.6
4:03 −10.4	10:05 − 6.9	11:54 − 6.7	3:55 − 9.8	12:57 −11.1
5:02 −10.1	11:03 − 6.6	1:56 − 7.3	4:50 −10.1	2:03 −10.9
6:07 − 9.4	12:16 − 6.8	4:07 − 8.9	5:58 −10.6	3:10 −10.2
6:46 − 8.4	1:09 − 7.4	5:53 −10.1	6:42 −10.8	4:00 −10.1
8:01 − 8.0	2:16 − 8.4	7:05 − 9.5	8:19 −11.0	4:56 −10.4
9:10 − 7.1	3:04 − 9.2	7:55 − 9.2	9:42 −10.5	5:52 −10.5
10:06 − 7.1	4:06 −10.1	8:58 − 8.1	10:52 − 9.8	6:52 −10.7
11:02 − 7.7	5:02 − 9.5	10:02 − 7.1	11:52 − 9.7	7:53 −11.1
12:26 − 8.1	6:08 − 9.1	10:58 − 6.9	1:54 − 9.0	9:17 −11.6
2:00 − 8.8	6:44 − 8.9	12:12 − 6.8	3:54 − 9.9	10:06 −11.7
4:00 − 9.3	8:06 − 7.4	1:07 − 6.9	5:59 −10.1	11:01 −12.0
6:01 − 8.3	9:08 − 6.5	2:04 − 7.6	7:05 −11.4	11:54 −12.0
7:02 − 7.9	10:02 − 5.8	3:04 − 8.2	8:15 −11.8	12:58 −11.8
8:08 − 6.7	11:00 − 5.5	4:06 − 9.2	9:00 −12.3	1:50 −11.8
8:58 − 6.7	11:58 − 5.6	5:08 −10.2	9:59 −11.8	4:00 −11.7
10:09 − 6.3	2:02 − 7.6	6:38 −10.3	10:54 −10.9	6:05 −11.7
11:06 − 6.5	4:02 − 9.1	8:02 − 9.9	1:56 − 9.4	7:00 −11.8
12:12 − 7.1	6:03 − 9.2	8:56 − 9.4	2:54 − 9.4	8:04 −12.3
1:02 − 7.5	6:58 − 8.3	9:59 − 8.5	3:56 − 9.7	9:05 −12.9
1:54 − 8.0	8:13 − 7.5	10:58 − 7.7	4:56 −10.1	10:01 −13.0
3:10 − 8.8	9:12 − 7.1	12:00 − 7.6	6:22 −10.7	10:59 −13.4
4:00 − 9.1	10:02 − 6.4	2:02 − 8.4	7:50 −11.9	12:10 −13.2
4:55 − 8.8	10:56 − 6.4	4:16 −10.3	9:06 −11.8	1:00 −13.2
6:02 − 8.3	12:10 − 6.7	5:56 −11.1	9:59 −11.2	2:00 −12.7
6:49 − 7.7	12:58 − 7.2	7:08 −11.5	10:54 −10.8	2:57 −12.7
8:00 − 6.6	2:10 − 8.1	8:02 −10.9	11:58 −10.4	3:57 −12.3
9:18 − 5.7	3:00 − 9.3	8:55 −10.4	2:02 − 9.5	4:59 −12.0
10:08 − 5.5	4:00 −10.1	9:52 − 9.9	4:04 − 9.7	5:55 −11.8
11:03 − 5.4	4:53 −10.0	10:58 − 9.1	6:46 −10.9	6:54 −11.9
12:03 − 5.9	5:55 −10.0	12:09 − 8.5	8:03 −11.4	7:52 −11.9
2:00 − 7.3	6:53 − 9.6	12:58 − 8.2	9:04 −11.3	8:55 −12.2
3:55 − 8.6	7:58 − 8.9	2:03 − 8.3	10:10 −10.9	9.59 −12.6
6:00 − 8.1	8:55 − 7.7	3:07 − 9.3	11:02 −10.5	12:02 −13.3
7:28 − 6.8	9:55 − 6.8	4:02 −10.1	12:08 −10.0	1:47 −13.4
8:34 − 6.2	10:52 − 6.4	5:00 −10.8	12:54 − 9.5	4:00 −12.9
9:38 − 6.0	11:54 − 6.2	5:59 −11.4	2:00 − 9.1	5:56 −12.1
10:43 − 5.8	3:22 − 8.7	7:04 −11.4	3:10 − 9.2	7:12 −12.2
11:44 − 6.0	5:02 −10.2	8:00 −11.3	3:58 − 9.4	8:24 −12.5
12:44 − 6.6	6:31 −10.1	8:55 −10.6	4:56 − 9.7	9:11 −13.2
2:02 − 8.0	8:10 − 9.2	10:12 −10.0	6:02 −10.0	10:03 −13.4
2:46 − 8.8	9:03 − 8.6	11:07 − 8.9	6:48 −10.3	11:00 −14.1
3:54 − 9.1	10:04 − 7.9	12:11 − 8.5	7:58 −10.6	11:48 −14.2
4:58 − 8.9	10:58 − 7.6	1:54 − 8.1	9:04 −11.3	12:58 −14.1
6:14 − 8.2	12:12 − 7.4	4:50 −10.1	10:10 −11.2	1:58 −14.1
8:20 − 6.5	12:58 − 8.0	5:47 −10.7	11:05 −11.0	3:18 −12.8
9:14 − 6.2	1:54 − 8.3	6:58 −11.0	11:58 −10.9	4:02 −12.7
9:59 − 5.8	3:08 − 9.4	7:57 −11.2	2:02 −10.2	4:53 −12.2
11:10 − 5.4	4:03 −10.0	9:00 −11.1	4:09 −10.0	5:54 −11.6
12:06 − 5.7	5:02 −10.6	9:57 −10.3	6:14 −10.4	6:52 −11.4
1:51 − 7.3	5:58 −10.9	11:02 − 9.6	7:43 −11.1	7:54 −11.1
4:17 − 9.0	7:12 −10.3	12:10 − 9.1	8:52 −11.1	9:09 −11.2
6:50 − 8.4	8:36 − 8.6	1:12 − 8.6	10:01 −11.6	10:11 −11.9
8:07 − 7.6	10:02 − 7.4	2:07 − 8.8	11:06 −11.3	11:00 −12.5

TABLE IV—*Continued*

A.M. October 24	P.M. October 26	A.M. October 29	P.M. October 31	A.M. November 3
12:16 −13.2	3:17 −16.0	9:01 −17.5	5:04 −21.1	11:03 −21.7
1:55 −13.9	4:07 −16.0	10:00 −16.7	5:47 −21.5	12:14 −21.3
4:09 −13.6	5:14 −15.7	11:04 −16.3	6:44 −22.1	12:58 −21.5
5:56 −12.5	6:35 −14.7	12:18 −16.3	8:13 −21.9	2:04 −21.0
6:58 −12.0	8:16 −13.1	12:56 −17.0	9:08 −21.1	3:07 −20.6
8:03 −11.9	9:10 −12.4	C = −1.60	10:00 −20.8	4:02 −20.9
9:00 −12.4	10:09 −12.4		11:19 −19.9	5:04 −21.1
9:56 −12.5	12:04 −13.5	2:03 −17.9	12:34 −19.4	5:58 −21.5
10:54 −13.3	1:54 −15.6	3:05 −19.6	2:10 −19.2	6:44 −21.8
12:04 −14.3	4:01 −16.9	4:01 −20.4	4:02 −20.3	8:07 −22.4
12:59 −14.7	5:52 −16.3	5:00 −21.4	5:57 −21.6	9:07 −22.4
2:00 −15.0	7:12 −14.9	5:42 −21.7	7:18 −22.2	10:11 −22.4
2:56 −14.7	8:08 −14.1	6:48 −21.4	7:58 −22.3	11:06 −22.1
4:00 −14.1	9:16 −13.3	7:56 −20.9	8:54 −22.3	12:00 −22.3
4:55 −13.3	10:07 −13.1	9:10 −19.7	10:04 −21.4	2:06 −21.9
6:05 −12.6	11:00 −13.2	10:10 −18.4	11:08 −20.5	4:07 −22.0
6:48 −12.4	12:10 −13.9	11:04 −18.1	12:10 −19.8	6:06 −22.2
8:00 −11.8	12:52 −14.6	12:02 −18.2	1:02 −19.4	7:08 −22.6
8:55 −11.5	2:07 −15.8	C = +0.60	2:00 −19.5	8:11 −22.8
10:02 −11.8	3:03 −16.8		3:02 −19.6	9:02 −22.9
11:08 −12.6	4:08 −17.5	2:04 −19.6	4:04 −20.4	10:03 −23.1
12:16 −13.6	5:07 −17.3	4:08 −21.2	5:09 −21.1	11:08 −22.9
1:57 −14.7	6:01 −16.9	6:04 −22.2	6:02 −22.0	11:56 −22.9
4:04 −14.1	6:42 −16.5	7:05 −21.9	6:45 −22.5	1:05 −22.6
6:00 −13.2	8:04 −15.4	8:04 −21.1	8:00 −22.4	2:08 −22.5
7:03 −12.5	8:58 −14.3	9:26 −19.8	9:04 −22.5	3:09 −22.1
8:00 −12.2	9:56 −13.7	10:19 −18.9	10:06 −21.8	3:19 −21.9
9:17 −12.5	10:58 −13.7	11:06 −18.4	11:10 −21.2	4:08 −21.6
10:14 −13.0	11:58 −14.0	12:17 −18.3	12:25 −20.9	4:58 −21.4
11:05 −13.5	2:00 −16.6	12:56 −18.5	2:06 −20.2	6:02 −21.5
11:53 −14.4	4:02 −18.3	1:58 −19.0	4:05 −21.1	6:41 −21.7
12:59 −15.0	6:37 −17.8	3:02 −20.2	6:01 −21.8	7:57 −21.9
2:01 −15.8	7:20 −16.9	4:05 −21.5	8:04 −22.4	9:07 −22.2
3:12 −15.7	8:10 −16.2	4:59 −22.2	9:04 −22.5	10:00 −22.4
4:11 −15.1	8:59 −15.4	5:47 −22.6	10:09 −22.1	11:02 −22.5
5:00 −14.5	9:58 −14.9	6:48 −22.7	11.01 −21.6	12:14 −22.6
6:00 −13.9	10:59 −14.8	8:00 −22.0	12:08 −21.4	2:03 −22.3
7:01 −13.0	12:09 −15.0	9:08 −21.5	1:09 −20.8	4:00 −22.0
8:08 −12.0	1:05 −15.9	10:08 −20.6	2:17 −20.5	6:01 −22.0
9:06 −11.7	4:05 −20.2	11:10 −20.1	3:06 −20.8	7:02 −21.9
10:10 −11.9	4:34 −20.7	12:21 −19.7	4:06 −21.0	8:06 −22.2
11:04 −12.5	5:10 −20.2	2:08 −20.1	5:07 −21.7	9:02 −22.4
11:54 −13.2	5:40 −20.2	4:07 −21.8	6:34 −22.4	10:15 −22.5
2:06 −15.4	6:44 −19.5	6:17 −23.5	7:56 −22.9	10:59 −22.5
4:00 −15.7	7:57 −18.5	7:10 −23.3	9:08 −22.5	11:56 −22.5
6:03 −14.2	8:56 −17.4	8:20 −22.7	9:58 −22.5	1:05 −22.7
7:04 −13.4	10:00 −16.5	9:27 −21.6	11:01 −22.1	2:02 −22.4
8:26 −12.2	11:10 −15.9	10:07 −21.0	12:06 −21.9	3:00 −22.3
9:08 −12.1	12:10 −16.4	11:04 −19.9	2:08 −21.3	3:56 −22.1
10:07 −12.0	2:00 −18.3	12:12 −19.1	4:30 −21.4	4:56 −21.8
11:06 −12.7	3:56 −20.3	12:58 −19.0	6:14 −22.0	6:00 −21.6
12:01 −13.1	5:56 −21.1	2:22 −19.5	8:10 −22.7	6:43 −21.4
1:06 −14.3	7:05 −19.6	3:20 −20.2	9:18 −22.6	8:08 −21.4
2:20 −15.8	8:09 −18.7	4:11 −20.8	10:02 −22.4	9:37 −22.2

TABLE IV—*Continued*

P.M. November 5	P.M. November 8	A.M. November 11	P.M. November 13	P.M. November 16
10:56 −22.3	12:57 −23.1	9:15 −22.5	9:03 −26.8	2:24 −28.4
12:56 −23.0	2:04 −23.5	10:06 −22.7	10:00 −26.1	3:09 −28.9
2:10 −22.7	3:06 −23.8	11:04 −23.2	11:00 −25.6	3:58 −29.4
4:08 −22.5	4:10 −23.5	12:12 −23.5	12:00 −25.7	5:01 −29.9
6:07 −21.8	5:01 −23.2	12:56 −24.2	2:00 −27.1	6:16 −30.7
7:03 −21.8	6:02 −22.6	1:48 −25.0	4:08 −28.8	7:52 −30.9
7:54 −21.8	6:48 −22.0	3:01 −26.0	6:29 −29.1	9:05 −30.4
8:57 −21.8	7:55 −21.4	4:10 −26.6	8:00 −28.4	10:09 −29.7
9:59 −22.2	9:02 −21.2	5:02 −26.5	9:06 −27.5	10:58 −29.2
11:00 −22.6	10:03 −21.2	5:48 −26.3	10:02 −26.9	12:12 −28.6
11:56 −22.9	11:10 −21.7	6:46 −25.5	11:02 −26.6	1:59 −28.5
1:10 −23.4	12:14 −22.6	8:00 −24.6	11:59 −26.0	4:30 −29.8
2:03 −23.4	2:00 −23.9	9:02 −23.7	12:58 −26.3	7:09 −31.0
2:58 −22.8	4:04 −24.2	10:04 −22.9	1:54 −26.9	C=+4.54
3:58 −22.6	6:04 −23.2	11:00 −23.0	3:00 −28.2	
4:57 −22.0	6:58 −22.5	12:24 −23.4	4:00 −28.9	8:06 −31.2
5:58 −21.9	8:04 −21.8	1:58 −24.9	4:56 −29.3	9:04 −31.1
6:38 −21.3	9:04 −21.5	4:01 −26.4	6:04 −29.6	10:05 −30.8
7:50 −21.3	10:05 −21.6	6:20 −26.0	6:42 −29.8	11:06 −30.0
9:00 −21.3	11:25 −22.4	7:14 −25.4	8:04 −29.0	12:04 −29.4
10:02 −21.7	1:07 −23.7	8:06 −24.8	9:03 −28.2	1:00 −29.2
11:00 −22.0	2:22 −24.3	9:08 −24.1	10:12 −27.3	2:04 −28.9
12:08 −22.6	3:33 −24.5	10:06 −23.6	11:06 −26.9	3:07 −29.6
1:03 −22.9	4:28 −24.5	11:10 −23.7	11:57 −26.6	3:56 −30.0
2:03 −22.9	5:18 −24.1	12:16 −24.0	2:02 −27.5	4:57 −30.8
4:06 −22.5	6:06 −23.6	12:58 −24.6	4:02 −29.0	5:46 −31.8
6:03 −21.6	8:16 −21.8	2:03 −25.6	5:59 −30.0	7:02 −32.5
7:04 −21.5	9:11 −21.4	3:01 −26.5	7:49 −29.8	8:00 −32.6
8:00 −21.1	10:10 −21.4	3:57 −27.3	8:58 −29.0	9:08 −32.6
9:05 −21.1	11:13 −21.5	4:57 −27.5	10:10 −28.5	10:02 −32.5
10:02 −21.2	12:12 −22.2	5:52 −27.3	11:00 −27.8	11:00 −31.9
10:57 −21.4	1:56 −23.6	6:58 −26.8	11:55 −27.2	12:04 −31.3
11:57 −22.0	3:57 −23.9	7:59 −25.9	1:03 −27.4	2:00 −30.9
12:59 −22.4	5:55 −22.9	9:03 −25.2	2:08 −28.0	4:02 −31.2
2:12 −22.8	8:12 −21.2	9:59 −24.3	3:08 −28.5	6:03 −32.7
3:04 −22.5	9:24 −21.2	11:00 −24.2	4:04 −29.5	7:20 −33.0
4:08 −21.9	10:44 −21.4	12:08 −24.2	5:08 −30:0	8:14 −33.4
5:02 −21.7	12:14 −22.5	2:18 −26.3	5:49 −30.5	9:12 −33.3
6:01 −21.3	1:01 −23.0	4:09 −27.6	6:42 −30.5	10:04 −33.0
6:45 −20.8	2:00 −23.6	6:02 −27.7	8:09 −30.5	11:02 −32.6
7:42 −20.2	3:00 −24.3	7:22 −27.1	9:06 −29.9	11:56 −31.7
9:04 −20.3	4:06 −24.5	8:18 −26.3	10:01 −29.2	1:03 −31.3
10:03 −20.3	5:08 −24.1	9:16 −25.4	10:58 −28.6	2:00 −30.9
11:05 −20.7	5:56 −23.7	10:04 −24.9	12:10 −28.1	2:56 −30.8
12:04 −21.7	6:48 −22.5	11:00 −24.4	1:58 −28.3	3:55 −30.9
2:36 −23.0	8:54 −21.3	11:58 −24.6	4:11 −30.0	4:56 −31.0
4:11 −23.0	9:59 −20.9	12:55 −25.2	6:06 −30.8	5:46 −31.6
5:59 −22.0	11:03 −21.0	1:58 −26.0	7:04 −31.0	6:40 −32.0
7:09 −21.5	12:04 −21.4	3:06 −27.1	8:02 −31.0	8:02 −32.7
8:04 −21.4	2:01 −23.0	4:02 −28.0	9:02 −30.5	9:14 −33.0
9:00 −21.2	4:05 −24.3	5:07 −28.6	10:04 −29.7	10:00 −33.0
10:02 −21.4	6:03 −23.6	5:50 −28.9	11:01 −28.9	11:02 −32.9
11:00 −21.6	7:10 −22.8	6:42 −28.4	12:08 −28.3	12:02 −32.3
11:56 −22.1	8:20 −22.3	7:54 −27.7	1:10 −27.9	2:01 −31.7

TABLE IV—*Continued*

A.M. November 19		A.M. November 21		A.M. November 23		P.M. November 25		P.M. November 27	
4:05	−32.0	4:03	−32.3	7:00	−30.8	12:13	−31.7	2:01	−34.4
6:06	−32.2	5:54	−31.7	8:00	−30.2	12:58	−32.7	3:09	−35.8
7:08	−33.0	7:08	−31.2	9:03	−30.5	1:58	−33.4	4:09	−36.7
8:00	−33.5	8:01	−31.6	10:02	−30.6	3:02	−34.4	5:03	−36.9
9:12	−33.6	9:00	−31.8	11:00	−31.1	4:02	−34.8	6:10	−36.7
10:02	−33.3	9:59	−32.3	12:00	−32.2	5:00	−34.6	7:22	−36.2
11:00	−33.0	11:02	−32.5	1:05	−32.6	5:48	−34.1	8:09	−35.5
12:02	−32.6	11:57	−32.8	2:12	−33.2	6:47	−33.6	9:20	−34.7
1:16	−32.5	1:00	−33.1	3:01	−33.2	8:00	−32.4	10:09	−33.8
1:52	−32.3	2:00	−32.7	4:00	−33.1	9:00	−31.6	11:00	−33.3
C = −1.25		2:56	−32.5	4:55	−32.4	9:57	−31.2	12:00	−33.3
		4:01	−32.0	6:02	−31.5	11:00	−31.3	1:54	−34.4
2:58	−32.3	4:55	−31.6	7:55	−30.2	12:00	−32.0	3:42	−36.1
4:04	−31.6	5:56	−31.6	8:59	−30.1	2:02	−34.0	5:28	−37.2
5:04	−31.2	6:46	−31.3	10:01	−30.1	3:57	−35.2	6:29	−37.1
5:42	−32.0	7:58	−31.3	1:07	−32.7	5:48	−35.2	8:11	−35.9
6:57	−32.0	9:10	−31.5	2:59	−33.3	7:09	−34.2	8:58	−35.1
8:03	−32.4	10:07	−32.3	4:58	−32.7	8:10	−33.1	9:58	−34.3
9:12	−33.3	11:06	−32.7	7:03	−31.0	9:10	−32.2	11:00	−33.7
10:04	−33.1	12:05	−33.2	8:10	−29.9	10:08	−31.7	12:10	−33.2
10:58	−33.6	2:25	−32.4	9:12	−29.7	11:03	−31.7	1:00	−33.4
12:06	−33.3	4:00	−32.5	10:00	−29.9	12:12	−32.4	2:01	−34.3
2:00	−32.6	6:00	−31.4	11:08	−30.9	12:56	−33.2	3:10	−35.5
4:03	−32.2	7:06	−30.9	11:58	−31.8	1:58	−34.2	4:00	−36.3
5:55	−32.1	8:00	−31.0	1:04	−32.9	3:02	−35.3	4:58	−37.0
7:04	−32.4	9:00	−31.3	2:00	−33.7	4:00	−36.0	5:54	−37.5
8:00	−32.6	10:07	−31.7	3:12	−34.1	4:57	−36.6	6:49	−37.4
9:16	−33.3	11:00	−32.1	4:07	−33.9	5:51	−36.4	8:00	−37.0
10:10	−33.3	11:54	−32.8	5:01	−33.5	6:44	−35.8	8:39	−36.4
11:00	−33.4	1:00	−33.4	5:55	−32.8	7:54	−34.5	10:10	−35.1
12:02	−33.6	2:04	−33.2	6:44	−32.1	9:00	−34.1	11:52	−34.1
12:57	−33.4	3:11	−33.3	8:04	−30.8	10:04	−33.0	3:07	−35.4
1:55	−32.9	4:06	−32.7	9:02	−30.5	11:08	−32.7	5:09	−36.9
3:00	−32.4	5:01	−32.1	10:05	−30.6	12:27	−33.4	6:58	−37.2
3:58	−32.0	5:48	−31.8	10:56	−30.9	1:58	−34.6	8:14	−36.5
4:56	−31.8	6:40	−31.2	12:00	−31.8	4:17	−36.6	9:22	−35.6
5:49	−31.6	7:54	−30.8	2:02	−33.6	5:57	−36.6	10:41	−34.7
6:46	−31.9	9:09	−31.0	4:08	−34.4	7:07	−35.6	11:56	−33.7
7:56	−32.0	9:58	−31.4	6:00	−32.9	8:14	−34.8	1:15	−33.8
9:00	−32.5	11:10	−32.1	7:11	−32.0	9:10	−33.7	2:10	−34.3
10:06	−33.0	12:12	−32.9	8:16	−31.1	9:58	−32.9		
10:59	−33.3	2:01	−33.3	9:06	−30.6	10:58	−32.8		
12:04	−33.3	4:01	−33.0	9:59	−30.3	12:01	−32.7		
1:57	−33.1	6:02	−31.4	10:57	−30.7	12:42	−33.2		